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WHAT PROFITETH A NATION?

Lieutenant Colonel George B. Pickett, Jr., *Armor*
Assistant G3, Headquarters Fourth Army

The views expressed in this article are the author's and are not necessarily those of the Department of the Army or the Command and General Staff College.—The Editor.

IN HIS book, *Melville Goodwin USA*, John P. Marquand describes how the young Goodwin, as a lieutenant in France in 1918, saw mile-long columns of horse cavalry on the road waiting pathetically for the pursuit and exploitation phase that never came. There he beheld the sorrowful sight of an arm with a mission, but incapable of performing that mission because its means—the horseman—was obsolete. Long before 1918—to be exact, the day General J. E. B. Stuart fell at Yellow Tavern in 1864—the handwriting was on the wall for horse cavalry in modern battle. But horse proponents died hard, and justly so, for they recognized that the cavalry mission existed even though they failed to recognize the impotence of its means—the horseman—in the face of repeating and, later, automatic weapons.

The mission for the arm of mobility exists today just as it has always existed. Its means are the tank, the armored personnel carrier, and the self-propelled gun. However, even today there are those among us screaming loudly that the tank is soon to be relegated to a place along with the horse in the relics of the Smithsonian Institute. This verbal froth is not new. As a result of the Tunisian and Sicilian operations in 1943, even the great Sir Winston Churchill questioned the future of the tank and at least implied that the tank was finished. He and the Chief of the Imperial General Staff (CIGS) initiated a study to determine if there were not too much armor in the allied forces. CIGS even went so far as to say that "the war is back to 1918."

Of course, these views were shattered by the turn of such events as General George S. Patton's race across northern France, the German breakthrough in the Ardennes, in 1944, and the overrunning of Germany by the allied armor in the spring of 1945.

But still another prophet of doom for the tank arose. The book, *Modern Arms and Free Men*, by Vannevar Bush, contained the statement, "Another formidable opponent of the tank is the rocket-firing plane." Then came Korea and the march of the North Koreans to the gates of Pusan, with that doomed weapon—the tank. On the United Nations side were the rocket-firing planes, virtually unopposed by enemy air. Not only did the rocket firers fail to doom the North Korean armor, but they even failed to stop it. It was eventually stopped on the Naktong by United States tanks and artillery. The United States Air Force destroyed large numbers of North Korean tanks, and

We know that fire power can defeat manpower and that our manpower is limited. Knowing these things, can we accept any defense which provides less than maximum fire power and protection for our personnel?

greatly restricted their movement, but not even the more rabid air power zealot can claim that the United States Air Force doomed North Korean armor.

The tank "doomed"? Really it has never been exploited to its maximum capability. In his book, *Defense of the West*, B. H. Liddell Hart shows that armor has never really been tried. We had divisions called *armored* in World War II; but in reality, according to Liddell Hart, they were merely *mobile* divisions, for only a small fraction of the division was really *armored*. There were *armored* medical battalions and *armored* quartermaster battalions, but what was *armored* about them? Nothing except the offensive spirit that sets the *armored* soldier apart from the mass. Certainly their transport was not armored. For example, the 42d Tank Battalion had a close call between Kelberg and Andernach on the Rhine on 8 March 1945, because its *unarmored* gas trucks could not run the gauntlet of bypassed enemy in time to resupply the battalion on the night of 7-8 March. The battalion reached its objective on 8 March with almost empty fuel tanks. A major counterattack by enemy armor could have caused a difficult situation.

Korea

But so much for ancient history. Let us look at modern history—Korea. Prior to June 1950, there was a general and erroneous belief that tanks could not be employed in large groups in Korea. Then came North Korea with her *T34* regiments and her 105th Armored Division—yes, the North Koreans actually used an armored division in Korea during the summer and early fall of 1950. To our great fortune, as later events proved, this North Korean armored division was destroyed in South Korea in September 1950. There are many United Nations soldiers alive today simply because neither the North Koreans nor Chinese Communist Forces had an armored division on the Chongchon River in November and December of 1950. The long, disorganized, cold, and spiritless columns of United Nations troops, withdrawing south on one main road in each corps zone, would have been easy prey for massed armor. Many "hindsighters" will disagree with this, basing their claim on the bazooka, the rocket-firing plane, and similar means. These weapons had never stopped an armored division before; therefore, can we honestly assume, discounting national pride, that they could have been used to this end by a disorganized army withdrawing over enemy interdicted roads? Remember, in 1944 and 1945, when our armor overran German units in which almost every man had a *Panzerfaust?*

When we hear the prophets cry that the tank is doomed, just what do they mean by the term *tank*? The military dictionary says that a tank is a "full-tracked armored vehicle usually mounting gun and automatic weapons. Tanks are characterized by excellent cross-country mobility, armor protection, fire power, and are capable of great shock action."

At no time does the dictionary create an image of something which would require thousands of years to change through evolution. The term is flexible enough—certainly the thought behind it is flexible enough—to permit revolutionary changes in the species as required by changing battlefield conditions. For example, examine the crude cannon used militarily for the first time by Mohammed II at the siege of Constantinople in 1453, and compare it with the modern atomic artillery

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Lieutenant Colonel George B. Pickett, Jr., was a member of the 11th Armored Division in Europe during World War II. From 1947 to 1950, he was an armored instructor at The Infantry School at Fort Benning, Georgia. He served in Korea for 15 months as Chief of the Armor Section, IX Corps, and is presently an Assistant G3, Headquarters Fourth Army, at Fort Sam Houston, Texas.

of 1953. The tank dates from 1916; but compare today's tank with the tank of 1916 and you find tremendous progress. Extinction in its present design is predicted by some because of the forthcoming atomic age. Would it not still be a tank if the engine is atomic rather than internal combustion? The atomic submarine is still a submarine. The tank is not a weapon for which we seek a use, but it is a weapon developed to perform a specific mission. Its mission will not change but the form of the weapon can and must change to conform to the evolution of science. Any weapon developed to perform that mission will become the means of the arm of mobility regardless of its external or internal design and motive power.

We forever hear "there will always be a foot soldier," and we all agree. However, compare today's foot soldiers with the Virginians who charged at Gettysburg in 1863. The mission of the Virginians and the mission of the 2d Infantry Division at Heartbreak Ridge, Korea, were identical—to seize and hold terrain. Although there was quite a difference in the weapons with which each was armed, there was no difference in his mode of travel from the attack position to his objective. Both advanced on foot. There will always be a foot soldier primarily because the rifleman is essential for attacking areas accessible only on foot and for the "mopping-up" phase. How we transport him to the objective he is to mop up is based upon enemy weapons, terrain, obstacles, and proper adaptation of United States industrial potential. Is not the dismounted rifleman in the attack merely a target for the enemy until he can be placed close enough to the objective to use his individual weapon? He certainly does not become an effective fighting machine until he gets close enough to the enemy to use his rifle or Browning automatic rifle, and only reaches his maximum capacity in the assault and mop-up phase of the attack. However, there are those today who still believe in the "dominant role of the foot soldier." Korea is pointed out by them as proof, failing to realize that this revival of the predominance of the foot soldier is a result of Korean terrain only. When and if it happens, the decision in World War III may not be reached in Europe, nor on an isolated, mountainous peninsula.

Manpower Saturation

Some would fight, even today, man against man or manpower against manpower just as Lee tried—and failed—at Gettysburg. But our ground troops cannot survive on a man-to-man attrition basis. It is obvious which side would exhaust its manpower supply first. Korea showed that fire power defeats manpower in almost every encounter. The expression "almost every" is used simply because of other facts. The Germans learned during World War II that the Soviets thought nothing of saturating an area with greater numbers of men than the defending force could kill prior to being overrun. In many instances, the Germans defending an area had superior fire power, in terms of volume; but the Soviets either kept coming until the Germans' ammunition was exhausted or they put more men in the field than the Germans could destroy with their superior fire power before being overrun. This idea of manpower saturation and complete disregard of human losses was used at times by the Chinese Communist Forces in Korea. It can be expected as a standard tactic of any Soviet indoctrinated force.

A greater number of men equipped with weapons as good as ours will give the enemy superiority in both manpower and fire power. Therefore, not only must we develop our fire power to the maximum, but we must neutralize the effect of the enemy's fire power on our own soldiers. Body armor for infantry was used effectively on the defense in Korea and re-

duced casualties. Maximum utilization of armored personnel carriers in terrain areas suitable for their employment will materially reduce losses in the attack. We can use these carriers best by increasing the armored infantry strength of the Army. Increasing the armored infantry strength also implies increasing the tanks, armored engineers, and armored artillery to team with it: giving us more tank teams—armored infantry—armored engineer—armored artillery; or, translated into units, it means more armored divisions. The principle of fighting manpower with fire power and protecting your manpower from the enemy's fire power is best implemented by an armored division. There are numerous other reasons for increasing the armored division strength of our Army. This is but one.

Economy

The biggest ax being ground by the *economy* group is the *expense* of the armored division. "The armored personnel carrier is a luxury which we cannot afford; give us more tanks in the infantry division and there will be no need for an armored division." So speak the harbingers of disaster. This group should realize that the biggest single difference between the armored division and infantry division is not the ratio of tanks to infantry, that ratio can be changed without fuss by a Mimeograph machine in the Pentagon; but is the battlefield mobility afforded the tank-armored infantry-armored engineer team by the armored personnel carrier. Do away with the armored personnel carrier, and the armored division is destroyed through loss of its battlefield mobility.

Armored personnel carriers an expensive luxury? Economy is not merely *savings* on a dollar balance sheet, but savings in the most vital resource in our nation—manpower. The armored division is the means of providing victory with minimum personnel loss. The United States Government—meaning the taxpayer—pays an absolute minimum of $10,000, not counting widows' pensions, for each battle casualty. Even Dollar Sign Sams should be able to see the value of reducing our casualty rate. In terms of expenditure of our most precious commodity—the youth of our country—the armored division is the least expensive type of combat division. The 40-cent German mark was pegged at 10 cents in 1945 by the conqueror. The 52-cent dollar could easily be pegged at 5 cents under similar circumstances. What profiteth a nation if it saveth millions of cheap dollars and loseth its freedom?

America can no longer afford to permit the Soviet Union to weaken and finally destroy us through economic and military attrition. All in all, Allied nations constitute the first obstacle to Soviet realization of their aims. This makes it increasingly important that we collectively maintain ourselves collectively strong.

Admiral Arthur Radford

How Shall We Teach What to Whom?

Lieutenant Colonel Paul L. Bogen, *Armor*
Chief, Instructor Training Section, Command and General Staff College

THERE is a story for children called *Epaminondas* which tells of the trials and tribulations of a small boy whose mother sent him on a series of errands. Each time the boy was to bring home a different item from his aunt's house. Each task involved a new set of conditions. He had to bring home butter, a puppy dog, and a loaf of bread on successive trips. When he brought home the butter, he placed it on his head, under his hat. The hot sun melted the butter and when the hat was removed, the butter streamed down his face and over his clothes. Now Epaminondas' mother, like all mothers, was a teacher too, so she outlined for the boy the method to be used in carrying butter. Of course, it was the "approved method" at that time. Her presentation was excellent, although verbal. In brief, she outlined a procedure which included wrapping the butter in leaves and taking it to the brook to "cool it, and cool it, and cool it."

The boy learned well. Next trip he was given a puppy dog to take home. And so, applying his new learning he took the puppy, wrapped it in leaves, and "cooled it, and cooled it, and cooled it." Results—one drowned puppy, one sad boy, one irate mother. The sad boy was highly motivated to learn how to take care of a puppy dog. His mother was an enthusiastic instructor. He was directed to "tie a string around the puppy's neck and lead him on home."

The third errand involved bringing home a loaf of hot, fresh, baked bread. Remembering the tragic incident with the puppy, Epaminondas tied a string around the loaf of bread and led it on home. The crumbs furnished a feast for the birds but no bread was left for Epaminondas or his mother. There was obviously something wrong with the teaching of Epaminondas. Either his mother was a poor teacher, Epaminondas was a poor pupil, or the methods used were unsatisfactory. Perhaps Epaminondas was taught the wrong thing or was taught in the wrong way.

Teaching is an age-old problem, yet one so complicated and involved that we are continually searching for methods, procedures, techniques, and panaceas to be used.

The central problem of all education has been defined to be "keeping knowledge alive." Schooling is a short-cut to experience. Experience may involve mechanical activities or situational problems. Generally, we refer to these two areas, as far as education is concerned, as training and education.

The Army has defined these two areas in Army Regulation 350-5, *Education and Training*, dated 14 May 1952. The regulation states:

Education implies formal instruction and study leading to intellectual development to include the making of sound decisions. Training implies instruction and

There are no set rules or formulas that tell how to teach what to whom. We must evaluate our situation with full awareness of the main difference between students and teacher—knowledge of the subject

supervised practice toward acquisition of a skill.

This leaves us with two more terms to define: *intellectual* and *skill. Intellectual* means belonging to or relating to intellect which is "the power or faculty of knowing as distinguished from the power to feel and to will." *Skill* is defined as "the ability to use one's knowledge effectively; technical proficiency." It is necessary to use inferred or secondary meanings to differentiate more clearly between these two terms. Skill implies the application of knowledge of a technical or mechanical type. Intellectual implies the power to know or mental ability to understand.

Epaminondas, of the children's story, was trained to wrap an item in leaves and "cool it." He was trained to tie a string around an item and lead it home. His intellect was not developed to the degree that he had the mental ability to differentiate between the peculiar characteristics of differing items. In Epaminondas' case the differences between butter, a puppy dog, and a loaf of bread were so great and his inability was so absurd that it was ridiculous. The difference is not always so great. Yet, inability is almost always as absurd to those who have already mastered an area of knowledge as was the inability of Epaminondas in the story.

Lieutenant Colonel Paul L. Bogen served with the 6th Armored Division throughout World War II. Separated from the service, he returned to the faculty of the University of Nebraska as Director of Radio and Assistant Professor of Speech. His graduate study included 2 years' work in the College of Education at Ohio State University. As a member of the Reserve Officers' Project of the Command and General Staff College, he was assigned to the Instructor Training Section of the College during the summers of 1948, 1949, and 1950. In June 1951, he was recalled to active duty and became an instructor at the College. Since 1952, he has been Chief of the Instructor Training Section.

Students and Teachers

It is frequently pointed out that one of the major differences between students and teachers in a particular subject is that the teachers have mastered the area of knowledge under study. We hope the teachers have considerable knowledge concerning the area. The teacher, of course, may also have a broader experience in related fields or further advanced areas of the field.

Our ever present problem then is, "How shall we teach what to whom?" The *how* relates to method. The *what* relates to type of subject matter. The *whom* refers to student background. We will consider the *how* and the *whom* in turn. In both cases we shall attempt to relate the *what.*

Methods

In teaching, like all other human endeavors, tradition, custom, and habit all influence method. Many honest teachers willingly admit that they teach in a certain way because they were taught that way and it seemed to work.

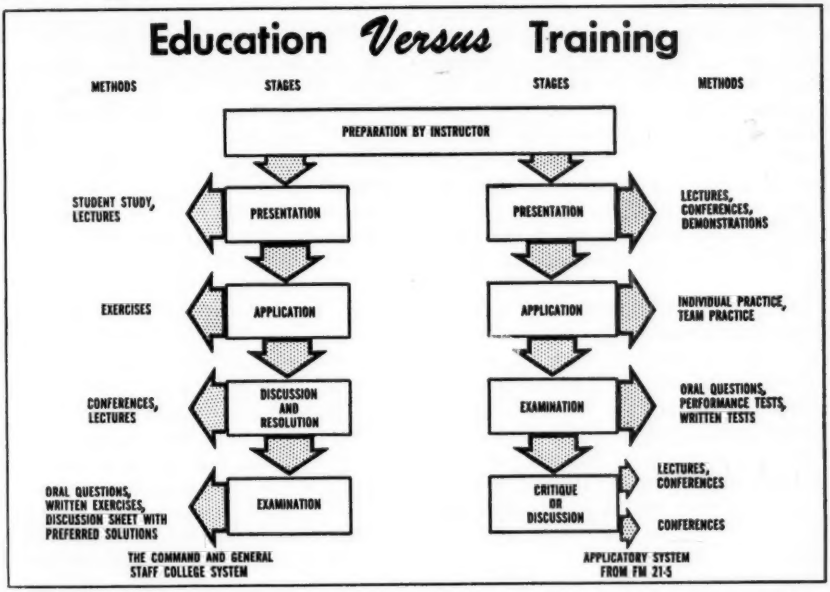
Frequently, teachers use a method because they are directed to do so. Some teachers or schools use methods prescribed by the educational leaders to whose philosophy they subscribe. Actually, this may be a blind acceptance usually requiring only that someone believes that the method has worked or has been partially successful. Of course, there are exceptions. Many teachers are truly interested in teaching and keep as a constant goal maximum learning by a maximum number of students. These dedicated teachers try to adapt methods to the individual student, or at least to adapt the method to the majority of students.

In another part of the academic sphere we have a group of educational researchers who are trying to improve methods or to test methods. They are continually searching for "the best way to teach a particular subject to a particular group."

One reason for the slow progress in this area is obviously the large number of types of subject matter and the inexhaustible number of types of groups. It has been said that "we know more about the psychology of the college freshman than we do of any group in our civilization." This handy test group is hardly typical of students or of people. In the military service we have had an opportunity to acquire a great deal of information about the type of students we are required to teach. Even in the military services, the types of groups vary greatly.

Field Manual 21-5, *Military Training*, presents a basic system familiar to every soldier: the five stage system of preparation, presentation, application, examination, and discussion. This system has been used so effectively and so extensively that it has become sacrosanct. Students at service schools are quick to condemn deviation—or assumed deviation—from this system. Too often the student assumes deviation from the system when the deviation is from the type of direct "troop leading" used in training. Field Manual 21-5 makes no provision for education, nor does it establish a procedure for the development of the intellect, to include learning to make sound decisions. There is a certain amount of education in all training and the training procedure is designed to get maximum learning of skills. The educational procedure will include training so that the student will have a minimum mastery of techniques and procedures. However, the educational process must include the posing of problems to the student so that he may solve them. By so doing the student should develop the ability to make sound decisions. In this area "troop leading" may produce an Epaminondas, a man who applies the right solution to the wrong problem.

The Command and General Staff College is faced with the problem of teaching students to solve military problems. The



procedure which is used was apparently established in the belief that if you want students to learn to solve problems, the best thing to do is to have them solve a great many problems.

In general terms, the procedure consists of four stages. First, the student studies. He is given study assignments which include doctrine, principles, and procedures. Second, the student solves problems which require application of the doctrine, principles, and procedures he has studied. Third, the solutions of the students are presented, compared, discussed, and a preferred solution is presented by the instructor. To complete the procedure, the student is required to take evaluated exercises, or examinations. He is given a "preferred solution" for these evaluated exercises so that he may check his learning.

It is frequently pointed out that the presentation phase of the military training system is omitted in the procedure outlined in the preceding paragraph. Actually, it is not omitted. The presentation is given in written form for student study. There is usually a brief period introducing the subject in which the student is given an opportunity to ask questions concerning the material he has studied the previous night.

This introductory period usually does not include explanation of problem solving procedures. As a result, another frequent criticism is that the student is expected to do things which he has not been shown how to do. If the student were shown how to do a problem and then given an identical problem to solve, he might well become a "robot" problem solver.

If he were given a different problem with similar aspects, he, like Epaminondas, could be expected to "wrap the puppy in leaves and cool it." This student might be considered a *trained* problem solver. The student must be *educated* to be a problem solver. He cannot be *trained* to be one. We might go so far as to say that mental anguish is an essential part of the educational process. When the mental anguish is eliminated by "troop leading," little education results. If trained, we must assume that the student can make the required adjustments and adaptations to solve varying, but related, problems. This is a very questionable assumption.

Communication, Key to Education

So far we have given little consideration to detailed method. Methods are usually defined in terms of what the instructor and the students do during the educational or training process. The basis of methodology, as far as the instructor is concerned, boils down to the type of communication. The instructor may tell the student. He may discuss with the student. He may show the student. He may, of course, use combinations of the three. We frequently use the terms lecture, conference, and demonstration to describe these methods. They are rarely pure. Usually they are combinations labeled on the basis of the dominant action.

In most cases, instruction is more effective when combinations of methods are used. For example, the good lecture frequently includes demonstration in the form of slides or charts, and includes conference in a question period. Similarly, the conference is introduced by a short lecture and is frequently summarized by one. Demonstrations too may be introduced within the conference.

The demonstration invariably uses a lecture introduction and frequently employs a running narration in lecture form. In this method, the student is given an opportunity to ask questions or his learning is checked by asking him questions. This question period employs conference techniques in instruction that is primarily demonstration.

Doing, or application, is generally accepted as being an inherent and required

part of instruction if learning is to take place. Some confusion arises from extremists ignoring the fact that listening is doing. The degree of concentration of the listener and the effectiveness of the lecturer determine the amount of learning. In some subject areas this may be the most efficient method for a particular situation.

In both education and training, emphasis on doing indicates the use of the exercise method. Exercises are applicatory instruction in which principles and techniques are applied to specific situations. This method is also a combination. Introductions and summaries are usually short lectures; group discussion of results, performance, or solutions to exercises are frequently accomplished through conferences.

Having emphasized the fact that methods are usually combinations of methods, we reach the crux of the problem: What nominal method shall we use when? An interesting research program reported by the Human Resources Research Office on marksmanship training emphasizes the need for continual evaluation of method. This study indicates the desirability of abandoning the old "part method" which included drill in each phase of marksmanship. The results of the project established that training in firing as a complete operation produced better marksmen. Here we become involved with the problem of whether students learn best by a step-by-step procedure, or by practice of the entire act. We usually assume that the more complex the act, the more emphasis must be placed on the steps.

However, we must be careful not to overemphasize complexity. Learning of complex acts is frequently easier when we learn the entire act than when we learn the parts or steps and then attempt to integrate them. Emphasis on learning the parts requires that the learner know the proper procedure for assembly of his learning. The background of the student provides a good basis for judgment in this matter.

Epaminondas apparently had no background experiences with puppy dogs to which he could refer. If he had, he would not have "cooled" the puppy in the water. In marksmanship training we must remember that most American boys have some knowledge of the use of firearms. At least they have seen them used by moving picture or television characters. They have a frame of reference to use during the marksmanship training and are ready for instruction in the "entire act."

Teaching Target

Thus, the key to "*how* we teach what to whom" becomes the *whom*. The greater the background in an area, the more effective the verbal learning. The smaller the background, the greater the need for "troop leading." The continual dilemma of teaching is the student group. Do we teach to the "best"? We may get the greatest amount of learning by a few if we do. Do we teach to the "poorest"? This should ensure minimum learning by all. However, we may lose the students with the most background from sheer boredom. Shall we teach to the middle of the group? The top group should still be interested enough to learn and the lowest group may get some of the learning desired. This appears to be a happy solution.

The ideal solution, however, is in the "individual maximum learning" approach. This requires that the instruction be adequate to ensure maximum learning by those with low capability and, at the same time, provides a challenge to the abilities of the best so that they too get maximum learning. This approach requires that instruction be presented in simple enough form that every member of the group can understand the required fundamentals. It further requires that there be sufficient time available to provide adequate learn-

ing opportunities for the slowest member of the group. Parallel with the provisions for the poorer students, there must be provision for the very best student. Advanced or related study, or learning experiences adequate to challenge the full capability of the best student, must be included in the planning and conduct of the class.

This may be done by having extra problems included on an optional basis. It may also be done by recommending advanced reading and reading in related areas. Discussion periods give students an opportunity to present related material to the class.

To accomplish "individual maximum learning," the class must be small enough to permit the instructor to provide individual guidance and assistance to all who need it. This optimum condition is rarely possible.

Grouping students by abilities will, of course, help. Careful student selection will also reduce the problem. It has been said that "if you have good students and good teachers you have good education regardless of the philosophy or methods which are used."

It Depends on the Situation

The harness of tradition guides us down a narrow path. It places blinders on the teacher and permits recourse in the argument that "the poor student could not learn anyway." An appropriate answer to this type of statement might be, "there are rarely poor students, usually just poor teachers."

There are no rules of thumb, no formulas that tell us "how to teach what to whom." We must carefully evaluate the *whom* with full awareness of that major difference between students and teacher —knowledge of the subject. We must plan our method, the *how*, without the blinders of such indefensible concepts as "the lecture is the poorest way to teach." We must be constantly aware that the teaching situation is a learning situation; it is the student who does the learning and no two learning situations are the same. We may have an Epaminondas in our class or our unit. We just cannot count on all students knowing as much about the subject or being as astute as teachers. If they were, they would be teachers and they too would be concerned with "how you teach what to whom." They would if they were good teachers.

Many years ago I heard General Charles P. Summerall say, "Men think as their leaders think." That remark has stayed with me ever since. Before your men can do the job under the terrible conditions of battle, you must teach them *what* to think about that job, *how* to think about it. You must work on their minds just as hard as you work on their bodies. Leadership is exerted on the mind.

Lieutenant General Williston B. Palmer

MANPOWER CONTROL TRAINING FOR ARMY MANAGERS

Lieutenant Colonel Paul A. Bucha, *Adjutant General's Corps*
Course Director, Manpower Control Officer Course
The Adjutant General's School

The views expressed in this article are the author's and are not necessarily those of the Department of the Army or the Command and General Staff College.—The Editor.

THE President's budget message to Congress for the ensuing fiscal year beginning 1 July 1954 and ending 30 June 1955 envisages an Army with a strength totaling 1,164,000 personnel. This will mean a reduction of 243,000, or 17 percent, from the year-end strength for Fiscal Year 1954, and a reduction of over 336,000 from the 1,500,000 strength prevailing during most of the current fiscal year. These prospective reductions in strength are to be achieved without impairment of the combat effectiveness of the Army. It is logical to assume, therefore, that it will be the supporting and service elements of the Army, rather than the operating or combat forces, which will be required to undergo the heaviest proportion of the cuts in personnel strength.

Although the supporting elements of the Army Establishment can look forward to severe slashes in personnel, the task of accomplishing currently assigned missions with fewer people will be relatively painless because of the rapid development, in the past few years, of techniques of manpower control. It is now possible to evaluate, quite accurately, the minimum manpower requirements for almost any activity performed in the supporting forces of the Army Establishment. Similarly, it is possible to determine which functional areas appear to be in the best position to absorb reductions in personnel. Until the development of currently effective manpower control procedures, the determination of manpower requirements for elements of the supporting forces presented an almost impossible situation. This was due to the fact that the supporting forces consist of many diverse, unrelated, uncomparable functions; they include fixed installations, each bearing its peculiar characteristics. They include procurement offices, arsenals, ports, depots, recruiting stations, training centers, transfer points, audit teams, warehouses, and laboratories. Standards for comparing personnel requirements for one activity with another appear unrealistic. For example, it is illogical, as well as impractical, to compare the numbers of personnel required to operate a training center with those needed at an arsenal. Furthermore, comparisons between similar activities are complicated by the mere fact of differences in location. A depot in Georgia

The Manpower Control Officer Course of The Adjutant General's School is training men to assist in the Army management objective of achieving better defense with fewer dollars and drastically reduced personnel

and a similar one in Utah justifiably appear to have totally dissimilar personnel requirements for similar functions. Under such circumstances, it was only natural that a tendency developed on the part of some higher headquarters to accept decisions of installation commanders as to the number of people they needed to accomplish an assigned mission. Installation commanders, in turn, accepted the opinions of their first-line operators as to the numbers of people which were needed. The end result was what could be expected —personnel requirements were often exaggerated, sometimes unrealistically and, in other cases, greatly inadequate.

Scientific Management

When the smallest of Army activities often operates under a budget totaling several hundreds of thousands of dollars, trial-and-error techniques of management can no longer be used in determining manpower requirements for any function. The process of determining manpower requirements for numerous, varied, and costly activities of the Army involves utilizing all the procedures and techniques developed by scientific management in order to arrive at sound estimates of man-hours required to perform assigned missions. This has resulted in the growth of a management specialist who has become an essential element of any headquarters staff —the manpower control officer. This specialist must be more than a fact-gatherer who visits an installation and obtains opinions from operating personnel as to how many people they think are needed to do a job. He must be a management consultant specialized so as to recognize and establish the correct relationship between a given workload and the minimum manpower required to accomplish that workload. He must be capable of assisting and advising the installation commander, or an activity chief, in methods of effecting economies of manpower. He must be capable of accurately determining the validity of justifications submitted in support of requests for increased personnel authorizations. He should be able to detect flaws in methods, procedures, or organization, which may be costly in manpower.

Effective Control

Effective manpower control, however, cannot be dependent entirely upon the manpower specialist—the staff officer who comes down from a higher headquarters to ascertain how many people the operator needs to do his job, or the analyst in the staff of the higher headquarters who reviews justifications for manpower authorization. Manpower control becomes completely effective when the same sense of urgency in achieving manpower economies is felt at the lowest operating level, as is felt at the command level from whence come the authorizations to use manpower. If supervisors of all activities which the Army operates could be made to feel as conscious of the need for conserving manpower as they are of the need for conserving supplies and matériel, a long step would be taken toward achieving real manpower economy. In any situation where manpower requirements must be determined, the philosophy of "what is the minimum manpower needed" should replace the philosophy of "let's see how much we can justify."

Lieutenant Colonel Paul A. Bucha was the Deputy Chief of Staff, Fifth Service Command, during 1943 and was assigned to Army Service Forces during World War II. He graduated from the Command and General Staff College in 1945, and later served with GHQ, Army Forces, Pacific Theater. He completed work for a Masters Degree in the field of management at Stanford University in 1947. He was Chief of the Plans and Policy Section, G1 Division, Headquarters, European Command from 1949 to 1952. He has been Director of the Manpower Control Officer Course at The Adjutant General's School since its beginning in 1952.

Maximum Justification

The philosophy of maximum justification has its origin in a feeling of insecurity on the part of the commander or the operator, or both—a feeling of insecurity which stems from the fact that an accurate relationship between manpower required and workload of the mission has not been established. The tendency to ask for the maximum is natural; it is a means of self-protection. The fact that an individual has the ability to lead a mission does not necessarily imply that he is also qualified to determine the manpower needed for that mission. Therefore, when a commander is asked to arrive at estimates of personnel requirements, and his estimates are derived from pure guesses, "safety" factors of 20 to 100 percent are usually added to compensate for possible errors or omissions in these computations.

The critical point in manpower control, however, is at the operating level. In the final analysis, it is at this point that determination of manpower requirements begins, and this is where utilization of manpower takes place. If the original step in determining requirements is based upon an exaggerated concept of what the minimum needs are, or if it is founded upon the philosophy of asking for the maximum, then the inflated requirement will be more difficult to recognize by manpower analysts who are located in higher echelons of command and are far removed from the actual scene of operations.

Manpower control has many facets. It involves considerably more than the determination of requirements. It includes such other functions as distribution of available manpower resources, ensuring proper utilization, manpower accounting, and review and analysis. In some cases, it is a function of G1, in whole or in part; in other instances, it is performed in the Comptroller's Office; in still other commands, it is split between the G1, G3, and the Comptroller staff sections.

Manpower control, therefore, becomes an integral part of the management of Army business at every level. Managers of Army activities, thus, in addition to planning and supervising the conduct of the operations, must assume the added responsibility of determining manpower requirements. Where can competent, trained, military and civilian supervisors be found in the Army who are qualified in the technical phases of an activity, and are equally competent to evaluate manpower requirements in terms of the minimum rather than the maximum desired? Such personnel are extremely rare. The answer to the question posed is that this ability to determine manpower requirements must be developed through training of key supervisors, staff officers, and installation commanders.

Manpower Control Course

In 1952, the Department of the Army established the Manpower Control Officer Course at The Adjutant General's School, Fort Benjamin Harrison, Indiana. This course—Army-wide and Army-conducted—was designed to give key personnel of all branches serving in middle management positions in the supporting forces, a basic understanding in management principles and techniques of manpower control.

The course now serves two purposes—first, that of qualifying key military and civilian personnel for the job of evaluating manpower requirements so that installations and activities of the Army can be operated efficiently with a minimum cost in terms of manpower. This objective, incidentally, assumes greater significance daily as the Army faces important reductions in manpower in the coming fiscal year. The second purpose served by the course is to furnish executive training to field grade officers and comparable civilians who, because of serving in supervisory or managerial positions in the Army, have a direct responsibility for

utilization of manpower in many of its support activities.

Since its inception in 1952, eight classes have been graduated from the 6-week course at The Adjutant General's School. Students attending these classes have come from all major commands in the United States and such overseas commands as USARCARIB, USFA, and USARPAC. Graduates of the course represent combat arms and services, as well as the technical and administrative services. Students have also come from G1 and Comptroller staffs of armies and services, from manpower survey teams, and from various supervisory positions at installation level.

Designed as an intensive training program for field grade officers and upper grade civilians in the field of manpower control, the course offers students training in such subjects as general management, performance analysis, the Army program system, statistics, work simplification, and manpower survey techniques and procedures. The scope and intensity of the subjects covered compare favorably with the executive development courses conducted for large industrial corporations by some of the better known colleges in the United States.

In addition to lectures and conferences, which furnish the students basic fundamentals of management engineering and related fields, a considerable portion of the course curriculum is devoted to seminar discussions of selected problems and case studies requiring the student to apply principles learned in the course to the actual determination of manpower requirements. Seminar work is supplemented by field trips to enable the students to see, at first hand, examples of top civilian management in operation, and to exchange views and opinions in conference sessions with key executives of some of the largest corporations in the United States.

The course is one of the most concentrated in the Army school system. The instruction is pitched at graduate level. Students meeting the qualifications for attendance are presumed to have the elementary knowledge in the fields of study offered. Announcement of the course, as well as a schedule of classes, was published in Department of Army Circular 40, 1953, which also stipulated the entrance qualifications desired in prospective students.

Management training programs in the Army are not something entirely novel. Many major commands, technical or administrative services, and even installations or staff agencies, have organized formal classes designed to give employees, as well as supervisors, training in work simplification, office management, and performance improvement. This is the first time, however, that these numerous management techniques, designed to result in improved performance, have been associated directly with manpower requirements so that the final objective is to accomplish the stipulated mission with the minimum of manpower. In addition to better job performance, the Army manager is being imbued with the idea of reducing his personnel requirements. The ultimate objective is to achieve better defense with fewer dollars and less manpower.

If you are moving, please notify the MILITARY REVIEW, Fort Leavenworth, Kansas, of your change of address. Be sure to include your name, *old* address, and *new* address.

AIR BASE CONSTRUCTION IS NOW A GOLIATH

Lieutenant Colonel Mitchel Goldenthal, *Corps of Engineers*
The Engineer Center, Fort Belvoir, Virginia

An engineer is a person who can build an item for one dollar that any fool can build for two.—Major General S. D. Sturgis, Jr.

The views expressed in this article are the author's and are not necessarily those of the Department of the Army or the Command and General Staff College.—The Editor.

PERHAPS the most striking illustrations of the tremendous evolution in engineer construction type units are the accomplishments of the engineer aviation units. The engineer construction organizations of pre-World War II were basically dependent on hand labor to accomplish their various missions. Very little construction equipment was organically present except trucks, and they were available in limited numbers only. However, these units had an excellent construction potential for light bridges, cantonment-type construction, repairs to existing structures, and roads. However, earthmoving, excavation, material hauling, rock-crushing, and concrete and bituminous-material production, and placing potentials simply were not present.

At this point, it should be remembered that those units were constituted to meet the then existing requirements which were largely tactical in nature. The advent of the modern airplane, tank, large gun carriage and other heavy, specialized, modern equipment has vastly increased the requirements with which the Armed Forces and the Corps of Engineers now must cope.

Limiting our discussion to airfield construction only, engineer aviation units were formally brought into existence on 4 June 1940, when the 21st Engineer General Service Regiment was redesignated by the War Department as the 21st Engineers, Aviation. Within 2 years, engineer aviation units had enjoyed world-wide deployment in the Virgin Islands, Hawaii, the Philippines, Alaska, Greenland, Iceland, Australia, New Caledonia, and England. The tremendous expansion of the Army Air Corps during this period obviously was matched by a similar expansion of engineer aviation units. At the risk of oversimplification, but to avoid any detailed figures, you may remember that General George Kenney, Air Commander in the Pacific, epitomized the situation frequently encountered when he said, "Down here operations require one-third Air Corps, one-third Engineers, and one-third everything else."

During the period between World War II and the Korean conflict, especially significant developments affecting engineer

The production of vastly heavier, faster, larger, and more expensive aircraft has made air base construction big business compared with the simple former task of felling a few trees on a smooth, grassy meadow

aviation units may be summarized into two general areas. The first area was occasioned by unification and the establishment of the United States Air Force as a separate entity. This problem was resolved by an agreement which was implemented by Special Category Army with the Air Force (SCARWAF) type units which were especially applicable to the engineer aviation units. The Army supplied the personnel, and activated and trained the units which were then placed under the operational and administrative control of the United States Air Force. Army personnel usually serve a 3-year tour with SCARWAF.

The second significant development occurred with the production of vastly heavier, faster, larger, and more expensive aircraft. (See chart on page 19.) Consequently, this equipment greatly increased the requirements for length and width of runways; larger taxiways, parking, alert and service aprons, stricter criteria relating to gradients, shoulders, approach zone clearances, and pavement design; huge quantities of petroleum, oil, and lubricants (POL); more and varied structures; large quantities of ordnance and large bomb dumps; and revetments and blast walls. It should be noted that several improvements, such as multiple landing gears and jato assist, have helped to offset some of the results of heavier and faster aircraft.

Lieutenant Colonel Mitchel Goldenthal graduated from the United States Military Academy in 1943, and received a Master of Science degree from Texas A&M College in 1947. During World War II, he served with the 90th Infantry Division, and later was Chief of the Technical Intelligence Section, G2 Division, Headquarters United States Forces European Theater. On duty with the United States Air Force from 1950-53, he was Operations Chief, 417th Engineer Aviation Brigade, and Commanding Officer, 1903d Engineer Aviation Battalion in Korea. He graduated from the Command and General Staff College this year, and is now assigned to The Engineer Center, Fort Belvoir, Virginia.

In World War II, engineer aviation units, for the most part, were able to repair existing airfields quickly, to grade new runways, and cover them with a surface of pierced steel plank or bituminous surfacing. Airfield effort was usually expressed in company weeks or battalion days or weeks.

The Korean Conflict

In the Korean conflict, the pattern was initially the same, however, this proved to be extremely unsatisfactory. The patching and lengthening of old fields had their limitations. Many were poorly situated—in a logistical support sense and direction-wise—and were originally constructed in accordance with criteria which was not applicable to the jet. The engineer effort and cost required to maintain pierced steel plank and most bituminous surfaced air bases was tremendous. It was necessary to turn to concrete and hot-mix bituminous surfaces. These proved to be quite adequate—especially concrete because of its inherent strength, flexibility of use, minimum effect by weather, and the presence of large quantities of cement in the Far East.

Air base construction effort was soon expressed in battalion months, or even years, and encompassed far more than the previous standard runway, parking, and taxiing facilities.

To properly realize the construction effort represented by these engineer aviation units, it will be necessary to examine these type units. The engineer aviation battalion (EAB) is the basic construction unit of the aviation engineers. It is self-sufficient—both administratively and operationally—and consists of a battalion headquarters, a headquarters and service company, a medical detachment, and three lettered companies. At full strength it numbers almost 1,000 officers and men—at reduced strength, approximately 700. A full-strength unit is capable of working

a full 24-hour, 2-shift day, whereas the reduced unit is only capable of a 1-shift operation.

The headquarters and service company is organized along the usual lines of engineer units with the following sections: administrative; communication; operation; supply; maintenance platoon containing the automotive maintenance, engineer equipment maintenance, parts and shop sections; and the heavy equipment platoon containing specialized type equipment (40), concrete (34), and quarry (34). The figures shown in parentheses indicate the number of additional personnel also authorized to operate and maintain the equipment. The battalion is capable of seeing a complete air base job through from preliminary design to the final touches. This, as well as the tremendous flexibility and staying power of the EAB, is demonstrated below in an illustrative example of air base construction in Korea.

Before proceeding to this example of the high lights of a complete air base construction job, other engineer aviation units should be briefly examined. EABs are usually controlled and supervised by engineer aviation groups which are principally operational headquarters capable of directing two or more battalions. For large-scale operations, an engineer aviation brigade is another operational type headquarters capable of supervising two or more groups. In Korea, the organization finally resolved to a brigade supervising three groups, two of which contained three EABs and one of which had five EABs.

COMPARISON OF AIRCRAFT USED IN WORLD WAR II AND THE KOREAN CONFLICT

Model	Gross Weight (in pounds)	Minimum Ground Run (in feet)	Tire Pressure (PSI)	Type
F-47N*	21,000	4,600	89	Propeller
F-51D*	13,000	2,720	56	Propeller
F-80C	20,000	6,000	142	Jet
F-84E	22,000	7,000	134	Jet
C-47D*	33,000	2,300	60	Propeller
C-124A	210,000	7,800	75	Propeller
B-17G*	68,000	3,780	86	Propeller
B-47C	180,000	9,400	176	Jet

*World War II Type

such as the rock crusher, ditch digger, asphalt tanks, and distributor.

Each lettered company has three platoons: earthmoving—containing all the tractors, scrapers, and graders; transportation—primarily 5-ton dump trucks; and construction. If considered necessary, the battalion organization may be altered to provide an earthmoving company, transportation company, and construction company.

To further expand the construction effort of the EAB, three different types of tabular augmentations have been authorized, usually on the basis of one per EAB, depending on the type of operation scheduled. The highest engineer aviation headquarters present usually allocated these augmentations to the various EABs with the concurrence of Theater Air Forces. The three augmentations are bituminous

Construction of K-6 Air Base

The illustrative example referred to above is the construction of K-6 Air Base in Korea by the 1903d EAB and attached and supporting units during 1952-53. All

engineer aviation units in Korea were assigned or attached to the Fifth Air Force. The staff agency of the Fifth Air Force, responsible for engineering construction activities, was the Directorate of Installations which operated directly under the Deputy Commanding General of Fifth Air Force. The Deputy Commander also commanded Fifth Air Force, Rear. In his search for new air bases which was complicated by adverse terrain, logistical and tactical support requirements, and necessity for a minimum 10,000-foot runway, the Director of Installations had few logical choices. He could expand existing facilities or construct new ones at K-6 Air Base. Accordingly, in the summer of 1952, he directed the Commanding Officer of the 417th Engineer Aviation Brigade to examine the feasibility of either expansion or new construction at K-6. The brigade made a preliminary report which pointed out the impracticability of lengthening the existing aircraft surfaces, but stated that a new runway of the required length was possible. The existing facility at K-6 was an old 4,900-foot Japanese concrete runway, built at right angles to the prevailing winds. The concrete had deteriorated badly and was covered by pierced steel plank. All facilities were grossly inadequate. Located at the base were a Marine air group—roughly equivalent to an air force wing—employing propeller-driven aircraft of World War II vintage, and an understrength Navy Construction Battalion (CB) for maintenance purposes.

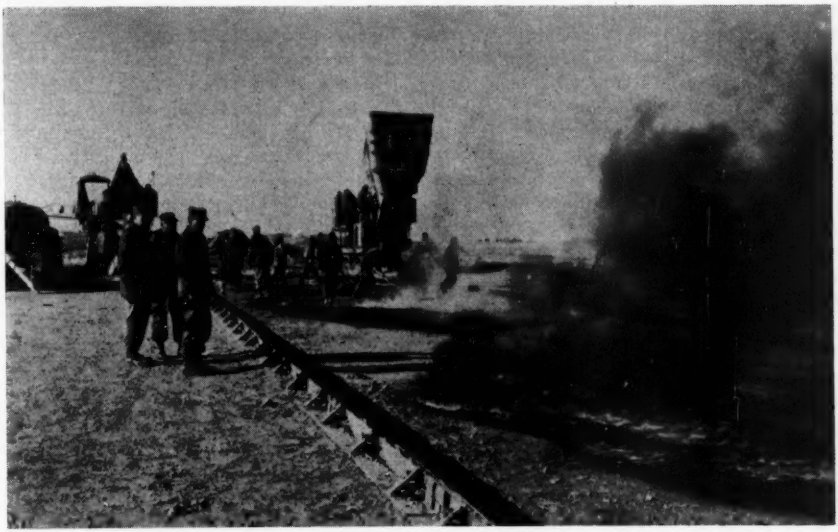
Preconstruction Planning

After studying the preliminary report, the Director of Installations ordered complete preconstruction planning and co-ordination for a modern concrete air base to be effected. The brigade, in turn, assigned this mission to the 930th Engineer Aviation Group because K-6 was within its area of responsibility. Complete plans and a construction schedule were drawn up by the group with the assistance and guidance of the two higher headquarters mentioned above. These plans included complete layout and design of all aircraft surfaces to include the runway, parallel and connecting taxiways, parking areas, dispersal loops, warm-up and alert aprons; runway lighting systems; access and service roads; bomb dumps; POL systems; electrical system; drainage system; sewage system; water system; buildings and other structures such as the operations tower, living quarters, and aircraft repair facilities. Also included in these plans were very detailed and complete earthwork computations and diagrams and complete concrete computations. These plans, together with troop unit, additional equipment, materials and supply requirements, and with complete justification for all items, formed the basis of a Class IV Project. This project request represented a joint effort by the Brigade and Group Headquarters with considerable assistance by the Directorate of Installations. Since the end of the normal construction season was rapidly approaching, permission was requested from Fifth Air Force to initiate movement of the construction units to the air base.

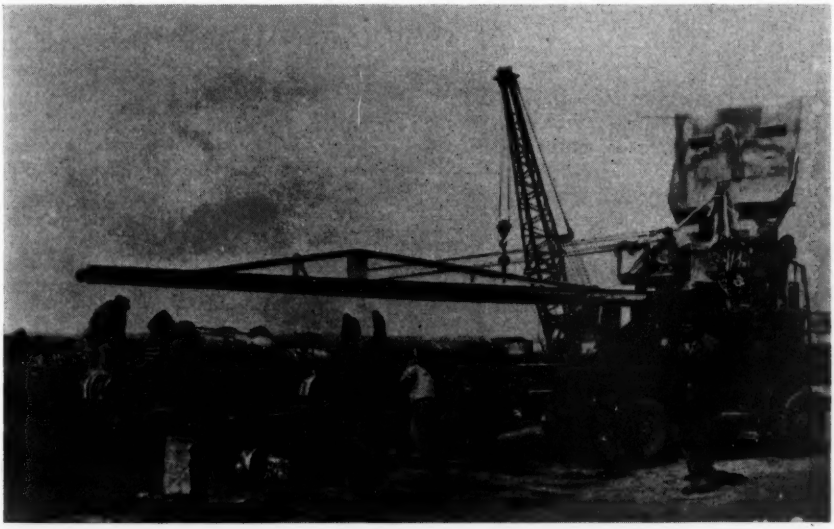
Movement of Troops

By the beginning of September 1952, permission was granted to move the 1903d EAB and for the brigade and group to divert any other construction effort that could be spared from other jobs to K-6 and initiate construction operations.

The 1903d EAB—originally a National Guard unit called to active duty in September 1950 and trained at Fort Leonard Wood, Missouri, and Beale Air Force Base, California—was located in southern Korea at two air bases more than 200 miles from K-6. Basically, the move involved the transfer of construction work to other units located at two air bases,



Extremely low temperatures complicated successful concrete placing as both the area to be surfaced and the water which was used had to be heated. Above, burning rice straw to heat the subgrade. Below, a 34E paver mixes the concrete and conveys the product to the finisher. The equipment in the background was used to heat water.



the moving of a thousand men and many thousands of tons of supplies and equipment several hundred miles, and the erection and establishment of an independent camp in a veritable wilderness. The Group Headquarters was 150 miles to the south, and most of the supply installations upon which the battalion was dependent were located 60 miles to the north. Arrangements were made with the Marine air base to share their POL facilities and to draw rations from them. In other matters, the battalion was on its own.

Construction operations on the new air base commenced on 16 September 1952.

By this time, the Headquarters and Service Company and "C" Company had been moved and the other two companies were in the process of moving to the new location. A full, 2-shift operation on the air base commenced simultaneously with the completion of the 1903d Construction Camp.

Control

The Commanding Officer of the 1903d EAB was designated Project Engineer and given full operational control of all engineer aviation personnel and units in the vicinity. Letter-type construction orders were received from the group as the entire project had been divided into subprojects for control purposes. A full radio report was made daily concerning all operations. Telephone service was very unreliable and difficult. Within about 1 month, the 1903d has been reinforced with heavy engineer and ordnance equipment, operators and maintenance men from six other EABs; an attached company to operate the quarry; another attached company to assist in the concrete placing, and an engineer aviation maintenance platoon in support.

By December 1952, the 809th EAB arrived on the job site and initiated work on the bomb dump; a new POL system—which included storage tanks and pumping stations—and quarry operation.

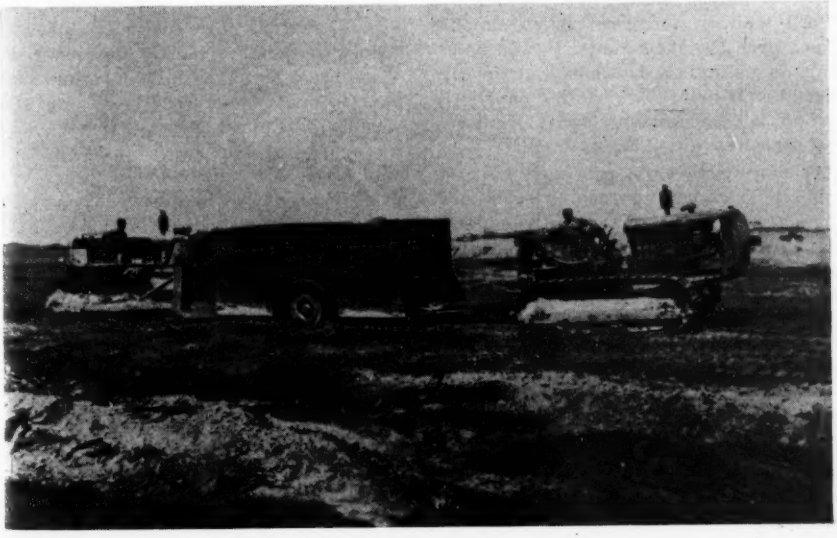
Despite many refinements and innovations, the backbone of an air base is still the runway. Other facilities may be damaged or otherwise rendered inoperative, and yet the air base will be capable of operating. However, when the runway is out of use, the remaining facilities cannot accomplish the mission. Of course, this factor is all important in the proper scheduling of air base construction; and, therefore, the runway is the first consideration. With this in mind, a limited examination of the organization and scheduling for construction and some of the other problems attendant to the construction effort seemed indicated.

First priority was, therefore, placed on the construction of the runway. This involved the necessary cutting and filling of earth to bring the runway to the prescribed grade, the installation of drainage structures, the placing of base course of noncohesive material on the graded earth, and the placing of concrete thereon. Because of the rapidly approaching cold weather, it was imperative that the placing of concrete begin at the earliest possible time. It was decided therefore, to level and grade about 2,000 feet of the runway and thereafter to continue both the earthwork and concrete placing simultaneously.

The characteristics of the terrain and weather were typical of south-central Korea. The weather was similar to that of the northeastern coast of the United States. Much of the terrain was under rice cultivation. In between the rice paddies were small hills which necessitated cuts of as much as 30 feet and correspondingly similar fills in the paddies.

The runway ran perpendicular to the general drainage system and necessitated five culverts under the runway—the smallest of these were two 24-inch culverts 350 feet long, and the largest of these were three 36-inch culverts 450 feet long. The soil was red clay with a very

Because of extremely low temperatures and drainage difficulties, the earthwork encountered more than the usual problems. Above, a D-8 tractor stripping earth while another, towing a 12-yard scraper, fills the low areas during initial earthwork operations at K-6. Below, a team of D-8s operating a 50-ton roller to compact loose earth.



high moisture content. As little as one-tenth of an inch of rain made the soil incapable of supporting any equipment.

Access roads from the camp to the Marine air base, the quarry, and the job site enjoyed an equal priority with the actual construction work on the runway. In the early stages of the job, any rain held up construction. The air base was at the mouth of a large estuary and, therefore, it was usually quite foggy in the morning and always damp. The cold, especially on the night shift, was very penetrating and required all the cold weather clothing available.

Construction Materials

Securing and locating construction materials and supplies was a major problem. Brigade controlled the shipment of Japanese cement from the ports. Nearly 1 million sacks of Japanese cement were received at the railhead. There were nine brands of cement in two sizes of sacks. The railhead was 6 miles from the air base and involved crossing a 600-foot, one-way bridge and the use of a poor road.

All military and construction supplies came over the same route. It was necessary to maintain a detachment at the railhead at all times. The hauling effort was staggering and severely taxed the capabilities of all the units involved.

A local source of rock—an essential construction material—had to be located, for any long haul was out of the question because of the tremendous tonnages involved. An old quarry was located about 3 miles from the air base. The rock was of inferior quality and the quarry had been worked improperly previously, therefore, it required considerable effort to correct past mistakes. However, it was the best source available and so it was used. The amount of rock required can be imagined if you consider that a good 2-shift concrete paving day required about 2,000 yards of rock. A total of eleven 50-ton per hour crushing and screening plants were utilized during the course of the job.

Sand proved to be a difficult material to obtain. The estuary was very silty and the closest river sand was about 7 miles away. The haul utilized the same road as the railhead haul. This haul was initiated but had to be abandoned because it was not practical to continue it. The road from the railhead became too congested and laboratory tests revealed that the sand was too fine, therefore the concrete made from it did not have satisfactory strength and lacked other essential characteristics. A deposit of sand was located at the quarry and, although it was quite coarse, it was used.

A dependable supply of water proved to be exceedingly difficult to obtain. The original plan was to pump it from the estuary through a pipeline. This plan was speedily discarded when tests revealed an overabundance of silt in the water. The water supply for the camp had been obtained by drilling three wells. A good construction day required about 70,000 gallons of water, plus additional amounts for curing and preparing the subgrade. Wells were incapable of supplying such quantities of water reliably. There also was the possibility of exhausting the water supply of the camp. Therefore, the only other possibility was to utilize rice paddy water which proved to be quite satisfactory in spite of the organic matter occasionally encountered.

Earthwork

Earthwork encountered more than the usual problems inherent in this type of work. Equipment utilized was D-8 tractors with blades for stripping, clearing, and pushing; 12-yard scrapers towed by D-8 tractors or large pneumatic-tired tractors; sheepsfoot rollers and 50-ton rollers towed by D-8 tractors to compact the earth; 13-wheel pneumatic rollers towed

Locating and securing construction materials and supplies proved to be a momentous problem. Above, activities at the quarry included the operation of three rock crushers and the loading of trucks for movement to the aggregate stock pile. Below, a team of 2-yard shovels preparing to load trucks in the base course pit near the runway.

by small rubber-tired tractors for compaction and sealing; motorized graders for final grading and towed-type graders for ditching.

Company "C," 1903d EAB, was given operational control of the earthmoving equipment at K-6 and full responsibility for all earthwork and drainage structures. Individual companies furnished the operators and maintenance and kept full property accountability; Company "C" had approximately 45 D-8 tractors under their operational control most of the time. Organized maintenance periods were held on the job site twice a day under the supervision of the senior officer present. Constant personnel rotation made a comprehensive on-the-job training program a necessity. Replacements were extremely eager to learn and work, but it was a continuous struggle to train enough of them to keep the job going. Preparation of previously mentioned aircraft surfaces, shoulders, and removal of lateral and other obstacles involved a little less than 3 million cubic yards of earth being moved—the runway alone involved more than 1 million yards.

At temperatures of 30 degrees below freezing, the scrapers would not dump their loads because the earth adhered to their sides and bottoms. It was necessary to suspend excavation operations during this period. The D-8 tractor was essentially the backbone of the earthmoving operation. Meeting the established compaction criteria was a never-ending battle because of the freezing of the clayey soil. The 50-ton roller was most effective. Compaction tests were made many times each day to ensure proper quality, and records were kept of all tests.

Base Course

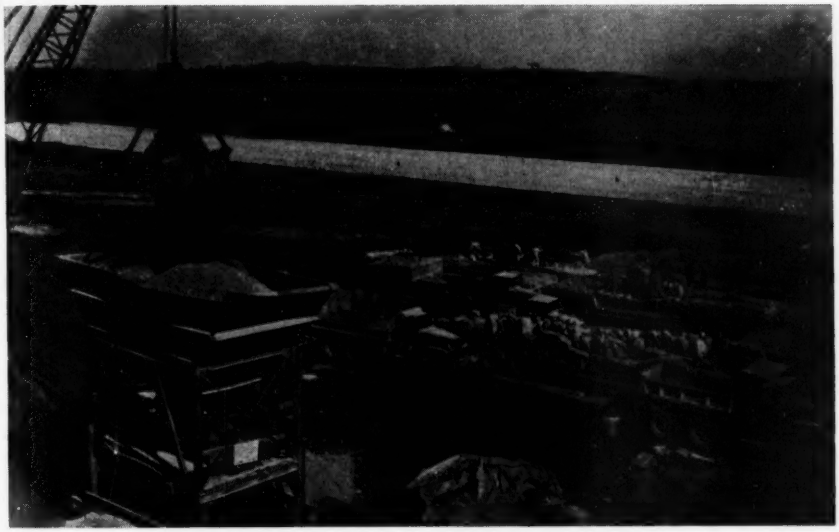
After the earthwork was brought to grade, it was decided to place a minimum of 6 inches of base course to protect against frost action and to provide a workable surface during wet weather. By good luck a deposit of copper ore was located at the north end of the runway. This cohesionless material was ideal as it formed a hard wearing surface when compacted. This material also was used extensively in road construction.

The base course pit was initially worked by large pneumatic-tired tractors towing scrapers. The speed and maneuverability of these tractors were ideally suited to this operation. However, after the pit had been worked and the ore became harder, the scrapers could not pick up a load and it was necessary to move in a 2-yard shovel and use trucks and dump wagons to haul the base course.

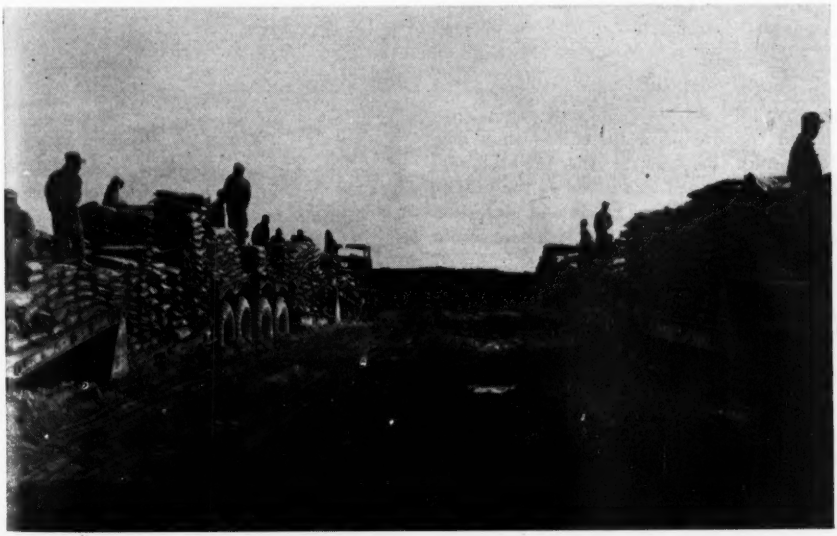
The base course operation was allocated to Company "B," 1903d EAB. In addition to this, Company "B" was given responsibility for building about 7 miles of roads; maintaining the 20 miles of roads within the area; and all hauling. The hauling included crushed rock and sand from the quarry to the aggregate batching plant, as well as cement and other supplies from the railhead. Company "B" was also given responsibility for all building construction, including two 96- by 48-foot and one 405- by 110-foot cement warehouses, as well as loading ramps for the rock crushers, fences, structures for the new air base, and the runway lighting system.

To accomplish this, Company "B," was given operational control of all trucks, truck tractors, trailers, dump trucks, and dump wagons. This worked in much the same way as described previously for the earthmoving equipment except that all maintenance was performed within the respective company areas. Over 100 dump trucks were controlled by Company "B." Radios were used to control the hauling effort.

Concrete placing was the next major subdivision of the job. Equipment used was two 34E concrete pavers, aggregate batching plant, two 2-yard cranes to



Three of the essential ingredients of concrete are fine and coarse aggregate and cement. Above, after being loaded with measured quantities of the combined aggregate at the batch plant (shown in left foreground), trucks received allotted portions of cement. Below, cement trailers preparing to make their additions to batch trucks.



charge this plant, two concrete finishers, 2,000 8-inch steel forms, various platforms and trailers to hold cement, water trailers, bituminous distributors and 3-car tank car heaters used to heat water, water heaters on the paver, wooden frames upon which tarpaulins were stretched to protect the curing concrete, ground type gasoline heaters, various water pumps,

A concrete batch truck delivering its load to the skip of 34E paver on the runway.

air compressors, and asphalt kettles for the joint-filling. The concrete placing required the use of a little less than two companies. Because of the low temperatures, great care was given to the proper preparation of the subgrade and materials and the proper protection of the concrete while curing. Concrete was usually placed 8 inches thick and 25 feet wide, but the Project Engineer had the authority to thicken it where he deemed necessary. In some places, it was as much as 16 inches thick. The concrete placing could be described simply as the arrival at the paver —which crawled along the lane being paved—of water, cement, and fine and course aggregate in the proper amounts at the proper time.

The subgrade was accurately graded and surveyed; batter boards were surveyed in; steel forms were placed; in warm weather, water was placed on the base. In cold weather, diesel oil was poured on the base and ignited to warm it up. Trucks were filled with measured amounts of sand and rock at the batch plant and then proceeded to the cement platform where cement was added, after which they stopped to receive sodium chloride which was used to accelerate the setting process in cold weather. Vehicles then proceeded to the paver and deposited this mixture in the paver skip.

Water was transported from the pumping station to the paver and pumped into the paver. Every possible heating device was used to raise the temperature of the water during cold weather. The paver mixed the ingredients and deposited the

Concrete is placed on one section of the runway while a grader prepares the next.

concrete in the proper place. The concrete was leveled by the finisher—a final finish was placed on the surface with burlap. Joints were made at specific intervals along the sides. Curing concrete was covered with straw and tarpaulins on top of the straw during cold weather. Ground heaters were placed in operation to blow

hot air under the tarpaulins during cold weather. After 5 days the straw was removed and a 4-inch layer of sand was placed and the joints were filled with asphalt.

At least several times daily test beams were made from the concrete at the paver and tested at specific intervals in the battalion materials-testing laboratory and full information was recorded, including the mixture proportions and the strength attained. The entire concrete placing operation was dependent on accurate planning, precise timing, and keeping all essential equipment operating. Any critical breakdown stopped the entire process.

Over 1 million square feet of concrete surface was completed by 13 February and the field was operational in May 1953. The first transport arrives at the completed field.

Summary

Behind the construction effort, outlined above, were many other pertinent facts which should be presented in order to provide a true picture of air base construction. The 1903d EAB arrived in Korea as a unit in 1951; consequently, during the first months of construction practically the entire battalion was rotated from Korea. The loss was felt severely in the officer and senior noncommissioned officer ranks and particularly in the equipment and maintenance warrant officers. Replacements were furnished but it was up to the battalion to provide the necessary training. Practically without exception the replacement officers and men demonstrated tremendous morale and a sincere desire to learn and to work. That spirit made the job easier.

Safety was emphasized and practiced by all ranks, and as a result an outstanding safety record was established. Careful planning and checking were also responsible for the lowest fire rate in the entire Eighth Army area.

Job management was emphasized in practice as well as words. Planning, scheduling, and supervision were keynoted. Staff visits and inspections by higher headquarters were frequent and much

valuable information was secured as a result of these visits.

Preventive maintenance was considered to be the most effective method of keeping equipment off "deadline." Supervised daily maintenance periods were held whenever possible. Accident and deadline rates, as well as production, were considered to be prime indicators of command effectiveness. Quality was regarded more highly than quantity. Complete, written quality control reports were kept on concrete strength, earth compaction, and aggregate gradation. An effective radio communications system assisted efficiency and helped to attain and maintain both quality and quantity.

The job area was large; it was roughly a stubby "T" with the bar going about 10 miles from the railhead to the quarry and the stem consisting of the construction camp and the new air base extending about 4 miles. Control, therefore, was essential.

Civilian Relations

Relations with the civilians in the area were quite tenuous initially, because four villages which were on the site of the runway had to be evacuated. However, after the unit assisted the local authorities in many ways—including several charity drives, entertaining orphans on various holidays, and leveling ground for new schools—the relationship improved markedly. The battalion worked very closely with the local officials and National Police in all law enforcement problems.

Unification

The job itself was actually a study in unification with all the services represented. Here was an Army engineer unit, attached to the Air Force constructing an air base for a Marine unit which was attached to the Air Force.

There was no command relationship between the Marines and Engineers, however. The Navy was represented by a Navy Construction Battalion.

All units worked closely and harmoniously together. Above all, the men doing the work had the "will to win" as testified by the initiation of construction on 16 September 1952, the commencing of concrete placing on 30 October 1952, and the completion of the runway on 13 February 1953.

Over 4 million square feet of concrete surface was poured and the air base was operational by May 1953.

Conclusion

This job illustrates some of the complexities facing an engineer aviation construction unit. This is typical of other air base jobs and points out that air base construction is a very big business which has gone a long way from finding a grassy meadow and knocking down a few trees. Many technical problems encountered were omitted in this article for simplicity. But this is an excellent example of how the engineers in Korea, as in the past, proved to be more than equal to the job.

In Korea, we have seen time and again the inestimable value of resupply by air in fast-moving tactical situations. The rugged terrain and inadequate roads and railroads have necessitated supply by air and, in many instances, it has proved to be the best means of supporting our troops.

General J. Lawton Collins (Ret.)

Evaluation of Weapons, Tactics, And Organizational Concepts

Lieutenant Colonel Thomas J. B. Shanley, *Infantry*
United States Army Forces Far East

The views expressed in this article are the author's and are not necessarily those of the Department of the Army or the Command and General Staff College.—The Editor.

NEW weapons have revolutionized ground warfare twice in the past 40 years. In World War I, it was the machine gun and massed artillery, in World War II, the tank and airplane supported by truck-borne logistics and modern radio communications.

What will it be in World War III? Atomic weapons, surely, unless they are outlawed as gas was in World War II. Large-scale movement of troops and supplies by air, perhaps, unless guided missiles make the airplane a dead duck in the meantime. One can speculate indefinitely—nobody knows the answer.

In the past, most armies have tried in peacetime to adapt new weapons to their old organizational and tactical concepts. One notable exception was the German Army which started World War II with an organization and a tactical doctrine tailor-made to exploit the airplane and the tank. In this war, the Germans got the jump on their numerically superior opponents and almost won the war before the rest of the world woke up. Ironically, the blitzkreig concept had originated in England and the United States. According to Guderian, a few zealots had managed to "sell" the idea to Hitler over the objections of the German General Staff. In the United States and Great Britain, the armored warfare enthusiasts were unable to get their concepts adopted and made operational until after the Germans had demonstrated their value in battle. In those prewar days, the armored concept was just one of many untried brain storms. Only a crackpot dictator would gamble everything on it—and it was a lucky gamble. Some of his other gambles that were not so lucky ruined him.

In the United States Army today, we are aware of the danger of fixed concepts and "backward" thinking in peacetime. We realize that decisive new weapons, future enemy capabilities, and likely future missions all call for new tactical and organizational concepts and new types of equipment. However, we will not be much better off than we were before unless we learn to evaluate weapons, organizations, and tactics.

The United States is not going to gamble on untried concepts. For example, I do not think we would use a large number of battalions equipped with self-propelled recoilless weapons, for the defense of Western Europe, unless we were fairly sure

The Army needs a combat development establishment which is capable of applying scientific procedure to the evaluation of equipment, weapons, and organizational and tactical concepts for the Army in the field

they would provide a tremendous increase in antitank fire power. Most of the armored experts think this idea is just a throwback to the old tank destroyer concept that was supposedly "proved" wrong in World War II. On the other hand, some people feel that a self-propelled recoilless weapon is essential for the defense of Western Europe. They believe that such a weapon, with about the same antitank killing power as a tank gun, would be almost as good as a medium tank against an enemy tank. They feel that the armor on the tank is of little value in tank versus tank engagements where the gun of either tank can pierce the armor of the other. They feel that we could afford to put a large number of relatively cheap, lightly-armored self-propelled recoilless guns on the battlefield. They argue that this is the only way to counter a massive tank threat, inasmuch as we cannot hope to put enough tanks on the battlefield to do it.

The tankers argue that these self-propelled weapons would not be able to exist on the battlefield. They say that the tank's armor pays its way by protecting the crew against artillery fire and such "poor man's" antitank weapons as the Soviet "elephant gun."

This particular problem is illustrative of many vital questions confronting Army planners which cannot be settled by holding conferences and writing staff studies. To decide on the merits of such an idea before D-day, we must learn how to evaluate the concept objectively. We have to be able to estimate how many enemy tanks the present infantry division's antitank defense will take care of in a mass tank attack such as we envision in Western Europe. We also must be able to determine how many more tanks a battalion of these midget "tank destroyers" would account for, how many tank destroyers would be knocked out in the process, and what additional logistical burden the tank destroyers would impose.

Operations Research

During World War II, a few British and American scientists began to work on some naval and air operational and gunnery problems. By applying scientific methods to these problems they made some useful contributions to the war effort. This work got the name "Operations Research." Since World War II, the Navy and the Air Force have expanded their operations research and the Army has established an all-civilian agency at Department of the Army level, known as Operations Research Office (ORO). In World War II, operations research was just about what the name implies. However, since then, much of the work has been concerned primarily with weapons' effectiveness, or estimations and comparisons of lethality, cost, and logistical requirements. The Ordnance Corps was studying the effectiveness of our weapons long before the term "Operations Research" was heard of, primarily at the Ballistics Research Laboratories at Aberdeen Proving Ground.

This operations and weapons research has been struggling along under considerable difficulty, and without much confidence or popular support from the Army, as many field soldiers mistrust any attempt to use scientific methods to study ground warfare. The civilian researchers do not have much day-to-day contact with

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Lieutenant Colonel Thomas J. B. Shanley graduated from the United States Military Academy in 1939. He was a battalion commander and regimental executive officer in the 508th Parachute Infantry Regiment of the 82d Airborne Division in Europe during World War II. He attended the graduate school at Princeton University where he received a Ph.D in Physics in 1950. He served as Chief, Research Division of the Research and Development Section, Office Chief Army Field Forces from 1950 to 1953. He is a graduate of the 1954 Regular Course of the Command and General Staff College, and has been assigned to USAFFE.

experienced Army officers and, consequently, they often are not guided by a realistic picture of ground warfare. The Army has not systematically obtained data from actual combat, and we have no facilities for extensively testing weapons and tactics on the ground under conditions approximating combat. Consequently, there is not much factual data for the researchers to analyze.

Therefore, it is not too surprising that many of their reports are somewhat "longhaired" and unrealistic. However, in spite of these limitations, our operations and weapons research agencies have pioneered in developing objective methods of evaluating weapons, tactics, and organizational concepts. And this ability to *evaluate* is the "missing link," without which we cannot decide in advance how best to organize, equip, and train the Army for the next war.

Objective Evaluation

At this point you may be thinking that ground warfare defies scientific investigation. You may feel that there are too many complex situations, too many unpredictable human reactions involved. I agree that ground warfare is a complicated business, but it is not immune to scientific methods of experimentation and analysis. The scientific method has been successful in such highly complex fields as economics, nuclear physics, and human behavior. These are fields where many of the individual happenings are unpredictable, except in the statistical sense, just as they are in warfare and poker.

However, we can often predict how many times out of 1,000 these "unpredictable" things will occur—how many neutrons in a thousand will split uranium atoms, or how many men in 1,000 will react in a certain way to a given situation. Similarly, if we had the necessary basic data we could set up a hypothetical tank attack and estimate what percent of the time a certain type antitank defense would destroy more than half the tanks before the attack reached the main line of resistance.

Even in the fields where they have been most successful, the scientists have not put together a complete and comprehensive picture. They have only succeeded in solving isolated parts of the puzzle. Nevertheless, much of their work has been of great practical value. The same would be true of a scientific investigation of warfare. I do not claim to be able to collect a few longhaired civilian geniuses who will quickly come up with a comprehensive analysis of ground warfare. But I do believe that a number of well integrated teams of military and scientific brains could really begin to get somewhere in 4 or 5 years with adequate facilities and support. By this I mean that we could begin to understand, in detail, some of the things that happen on the battlefield, and begin to evaluate and predict, with some accuracy, the effectiveness of new weapons, organizational concepts, and tactics on the battlefields of the future.

Combat Developments

To use scientific methods effectively, the Army needs a more adequate "combat development" establishment. This combat development organization should have the following mission: "To evolve an optimum system of weapons, equipment, organization, and tactics for the Army in the field." The Army's combat development effort should be co-ordinated and integrated with similar Navy and Air Force activities by a strong agency at the Department of Defense level.

What are the "means" that our combat development organization needs to accomplish the mission I have stated?

First and foremost a combat development establishment must integrate military and scientific know-how on a coequal status at the working level. It should at-

tack problems with "task groups." These task groups should be composed of officers who know the realities of combat and experienced scientists who know how to set up objective experiments and to analyze results.

Our present combat development organization has small groups of experienced officers at the arms schools. These officers do not have direct access to any scientific talent. At the other pole we have all-civilian groups at the Operations Research Office and at the Ballistic Research Laboratories. These people do research and analysis without a very realistic picture of ground warfare to guide them.

Field Tests

The Army combat development establishment needs ample facilities for field experimentation. At present it has none. To determine the best table of organization and equipment for the rifle squad we should do some comprehensive field tests. We should run 20 or 30 squads through some realistic combat firing problems with each type organization under consideration. If these tests were properly designed, and the results properly analyzed in the light of the additional psychological factors present in combat, they would give us a very good idea of the relative merits of the various organizations. Such tests should be realistic, and they should measure performance on the important jobs a squad does in combat. They should obtain such factual conformation as the number of targets hit, time to deploy and reach objective, percent of time each man is exposed en route to objective, time to issue instructions, and ammunition expended. The tests should be designed and the results analyzed so as to give statistically *significant* comparisons. For example, one test might result in the following evaluation: 90 percent confidence (or expectancy) that type A squads will average from 10 to 20 percent more hits per minute than type B squads on an irregular row of skirmishers in the bushes 300 yards away. A test like this is a real scientific experiment. We must take precautions to remove extraneous influences and bias.

For example, we should use the same test personnel throughout the series of experiments, otherwise one type of Browning squad may look better than another type simply because of a different average marksmanship ability in different groups of test personnel. We must stagger the order in which the various squads test different organizations; otherwise, the last type organization tested will look better than it really is because the troops will have had more firing practice before they got to this phase of the test.

To run a test program like this we need experienced soldiers to make it realistic and we need experienced scientists to get numerical comparisons that mean something. We also need some 30 rifle squads available *full time*, firing ranges, and considerable ammunition. To run field experiments continually on infantry weapons, organization, and tactics, the combat development establishment needs a regimental combat team available full time, and extensive range and maneuver areas. To run a similar program with armored units, a combat command should be made available full time.

You may ask why we cannot designate a tactical unit to run each of these tests for us on a one-shot basis, as we have always done in past field testing. The answer is that this is a completely different sort of test. I am not talking about the conventional troop test, where we hand out some new equipment to units and have them use it on maneuvers to determine its serviceability. A scientific field experiment to evaluate combat effectiveness is a much more detailed and precise operation.

The first test of this type which I know of has recently been completed at

Camp Irwin, California. Twenty-five tank crews ran realistic combat firing courses with several different types of tanks and fire control equipment. An officer riding the deck of the tank punched a stop watch when a target came into view, and recorded the time required to get a hit. Elaborate precautions were taken to ensure that the crews did not know the locations or ranges of targets in advance. The same 25 crews were used throughout the 4-month test period. This test will give estimates of the times required for average crews to get first hits with and without rangefinders, stabilizers, and other equipment. It will provide basic data for tank battle analysis. It will improve our understanding of the training factors involved with the equipment. In my opinion, tests of this nature should be going on continually in the fields of infantry, armor, artillery, and combined arms. But there are no troops units, no range facilities, and no dollars regularly available for such tests. Obviously, our combat development organization needs a "field laboratory," with representative combat units, ranges, maneuver areas, and funds. Without these, such field experiments cannot be run regularly as they should be.

The combat development organization should provide working level contact between the men who are researching the battle problems of the future and the people who do research and development of new weapons and equipment for the technical services. In our present system the "user" representative—normally Army Field Forces—submits "requirements" for new equipment to Department of the Army. Department of the Army turns each approved requirement over to one of the technical services where the requirement generates a project to develop a new piece of equipment. The user normally further amplifies the requirement by submitting a list of desired performance specifications, known as Military Characteristics, to the technical service through Department of the Army. This process is altogether too formal. It puts a wall between the men who are thinking about tactical requirements and the people who develop the equipment. The user representatives often do not know what is or is not technically feasible in a new piece of equipment. Consequently, they are inclined to "ask for the moon." In such cases they are not giving the development experts realistic guidance. The developing agencies do not know where to strike the balance when (as is usually the case) it is necessary to sacrifice one feature the user desires in order to meet his specifications on another characteristic. Often the developing agency will succeed in producing a piece of equipment that does everything the user wanted it to, but at a cost that he is unwilling to pay. By "cost" I mean not only dollar-cost but also "cost" in terms of many considerations such as logistical requirements or training time. The user representatives who determine the combat needs for new equipment should work side-by-side with the development experts in formulating Military Characteristics. They should arrive at the final specifications by a process of successive approximations.

Breadboard Models

In going through this process they should evaluate the various feasible combinations of characteristics and the cost factors in consideration of the job the equipment is to do in combat. They should be able to put together and informally test several varieties of "breadboard" or rough preliminary models of a proposed new item in order to determine the best of various alternative designs or ideas.

The combat development establishment must have adequate military and scientific talent, must provide for continuity of personnel and policy, must establish essential working relationships, and must have

ample facilities for field experimentation. Any organizational scheme that provides these essentials can get the job done, whereas a more impressive looking organization (on paper) that lacks these prerequisites cannot. Although a reorganization is not a cure-all in itself, I am inclined to favor the establishment of an independent Development Command. This organization should be a major operating agency of the Department of the Army. It should take over the present Army Field Forces responsibilities—and its personnel spaces—for doctrine, organization, and requirements for new weapons and equipment for the Army in the field. It should have operational control over the research and development activities of the technical services. It should take over from G3 and G4, Department of the Army, the detailed supervision of research and development activities, as well as the spaces which go with the job. It should absorb and integrate within its structure such civilian research agencies as the Operations Research Office.

There are two reasons for establishing a separate command for the combat development job. First is the need to run a completely co-ordinated and integrated program. This program will break down into thousands of individual research projects. But all these projects have to be part of a single over-all plan. The results of all the little individual projects should add up to answer some pretty big questions. How well can the present Army perform its likely future missions? How should we reorganize, re-equip, and retrain the Army for a two-sided atomic war in Western Europe? Our present combat development efforts are dispersed throughout so many different headquarters that a thoroughly co-ordinated program would be very difficult.

The second reason for a separate combat development organization is that these all-important functions should not be subordinated to training and operational planning. We now have small combat development groups in G3, Department of the Army, in Office, Chief of Army Field Forces, and at the arms schools, and the Command and General Staff College. These headquarters are all so preoccupied with operational and training responsibilities that the combat development job inevitably is slighted.

Conclusion

In these days of shrinking budgets, any idea that will cost money is suspect. However, it makes sense—especially in lean years when the Army is small—to devote a maximum effort to the job of evolving the best tactics, organizations, and equipment for the future. In order to do this, we need an adequate combat development establishment to evaluate weapons and tactical organizational concepts by applying scientific methods of experimentation and analysis to battle problems. This research can provide the factual information we need as a basis for new field manuals, new tables of organization and equipment, and requirements for new weapons and equipment. The time for this combat research is *now*, not after D-day, when money and talent will be plentiful but time will have already run out.

AUTHORS

Authors submitting materials to the MILITARY REVIEW are requested to forward manuscripts through the Security Review Branch, Office of Public Information, Office Secretary of Defense, The Pentagon, Washington 25, D. C.

Water Can't Rise Above Its Source

A. T. Lawson

The views expressed in this article are the author's and are not necessarily those of the Department of the Army or the Command and General Staff College.—The Editor.

MOST everyone will agree that we are blessed with a high level of competence among our military leaders. The majority of the higher ranking officers have proved they are capable of taking on any responsibility. Our younger professional soldiers have the qualities, training, and experience which make good leaders. Can we maintain this high standard of leadership? Some writers and a few professional soldiers have expressed some doubt that we can if present conditions continue. One writer, Mr. George Fielding Eliot, asks, "Has the Army Lost Its Soul?"

If by "soul" is meant those qualities which inspire men on to develop new ideas and serve the nation without stingily selfish desires, then there are danger signs that the Army may lose its soul in the years that lie ahead. One of these signs is that qualities of leadership are not regarded very highly any longer among so many of our people. Respect for those things that make men and nations strong has sunk to a low level.

Our leaders come from the people, and, as water seeks its own level, so will our Army leadership be no better than its people. What are we to do about cultivating the soil from which sprout those qualities which make competent leaders? Thus far, we have done little thinking as to the effect existing conditions will have on our leaders 25 years from now. The job of educating the public is not alone an Army task. Our people should begin to seek the reason we have lost respect for any kind of authority. Either that, or we might some day find ourselves with a problem similar to the one which England has in British Guiana.

For a quarter of a century we have had an ever growing segment of our people living on the negative side of life—believing they are entitled to everything they want without exerting any effort on their part. Johnny is raised to believe he should be given everything he wants, say what he pleases, and do what suits his undeveloped mind. There must be no spanking if he does anything he knows is wrong. We are told he must have self expression.

Now we see some of our potential Army leaders making demands for material comfort or they threaten to quit—they refuse to go along unless their selfish demands are met.

Discipline, courage, dependability, justice, accuracy, alertness, and integrity are qualities that have been forgotten. How can a man be fit to lead unless these qualities are present in his make-up?

We do not have to dig deep into history to learn that this sort of negative think-

Discipline, courage, dependability, and integrity are basic qualities which make men and nations strong, form character, and aid in promoting a high standard of leadership vitally needed in our Army today

ing and living leads to the worship of materialism from which grows communism. There is no place for it either in the Army or in business.

Every man who has had Army training knows that these qualities are necessary to win battles either in war or in business. Equipment, regardless of its kind or quantity, never won a battle alone and never will.

It takes men with a spark of spiritual inspiration to develop and put to work new ideas—to build a shack, a railroad, to sell a piece of real estate, or to win on the battlefield.

Many of our people have a faint idea of what it takes to manufacture an automobile or some other gadget made for civilian use—but to run an Army, no. To many of them it does not take men with brains to run the Army. Anyhow, the Army is too far out of their minds for them to care what happens to its discipline.

On several occasions in human history men have turned from God to the unstable values of materialism. The result has always been mistrust, hatred, bitterness, and confusion. The soul of the nation involved, as well as the Army, was soon lost.

The armies of Israel were among the best trained that had ever existed. Gradually the people turned from the teachings of Moses and their armies were thereafter defeated.

The placing of too much emphasis on selfish and material values—something for nothing—kept the light hidden for a long period during the days of Noah when civilization was destroyed. Respect for higher qualities of spiritual values was forgotten. No one cared about progress so long as their own selfish desires were satisfied. Noah built his ark and managed to save a bit of civilization at the last moment.

It rained for 40 days and nights! Destruction poured from the murky clouds of fear, waste, hatred, and confusion. It has been raining on us for a long time. Sometimes the clouds are darker than at others. And have we a Noah to build a boat for us? We do have experience and enough positive thinkers to start laying the keel for ourselves. We do not know how long before our 40 days will have ended, but it is time for us to begin thinking about it.

Since the days of Noah, civilization has been rocked back on its heels many times. Fortunately, we Americans have in the past managed to come out of our conflicts right side up. But each time the task is harder than before. Still, we stand by trying to wipe the mist from our eyes wondering what next.

We hear the chatter broken by a scream, "Give me another free handout that I may continue my wild spree." If the handout is slow in coming, or if it is not as much as they expected, they blame it on those above them. Many of those above them are just as bad.

People cannot be told what to say or what not to say, but they should be told again and again that this hatred of those above them—this disrespect for authority—is the kind of food on which the Communist thrives.

Why have the qualities which make good leaders lost favor with our people, and why has respect for authority sunk so low in the Army? Did the Army have anything to do with this lessening of respect?

There are many cases where an efficient Army officer has found himself in hot water with someone in Washington because he had taken disciplinary action against a wrongdoer. The people at home write their Congressman that their friend had been mistreated. This same officer may not want to take another chance of being called on the carpet—so he plays along

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Mr. A. T. Lawson was in the service prior to and during World War I, and served as an investigator for the Provost Marshal General's office during World War II. He is the author of numerous articles on business management.

with slack soldiering. He may be afraid of stirring up a hornet's nest. Regardless of the motive, his actions help to destroy authority. If such practice continues, the Army can become an unorganized mob.

It is not unusual to hear officers and noncommissioned officers complain about too much mixing of high and low ranking individuals. If we stop to reason this practice out, we must admit that it does lessen respect for authority.

Basically, all men are inclined to appreciate spiritual values. It was this kind of thinking that inspired our forefathers to push their way through the forest in building this nation. Had they emphasized material values, they would have been bankrupt from the start. They believed in proper authority and respected it because it was necessary for peace and harmony.

Our Government is slowly but surely adopting a policy of letting its people know that if they are to *have*, they must *earn*. The adoption of such a national policy, and any policy which the Army might adopt, for regaining and maintaining the proper respect for authority must be closely allied in concept for they are closely related in fact.

The Army public information system can do a lot to help the Government in this educational job. If we are to dwell together, we are going to have to learn to co-operate for the benefit of the nation. We are all going to have to learn again that real values come from spiritual things instead of material things.

THE MISSION OF THE MILITARY REVIEW

The MILITARY REVIEW has the mission of disseminating modern military thought and current Army doctrine concerning command and staff procedures of the division and higher echelons and to provide a forum for articles which stimulate military thinking. Authors, civilian and military alike, are encouraged to submit materials which will assist in the fulfillment of this mission.

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EVOLUTION OF AMERICAN MILITARY POLICY

Major Russell N. Cassel, *United States Air Force*
Editor, *Training Analysis and Development Informational Bulletin*
Air Training Command, Scott Air Force Base, Illinois

The views expressed in this article are the author's and are not necessarily those of the Department of the Army or the Command and General Staff College.—The Editor.

THIS article is an attempt to indicate the intricate roots which permeate the entire military history of our country and to point out the evolutionary growth of strategic air power as a tactical weapon.

The military strategy which a country employs during war or peace, both in defensive or offensive operations, must be considered in light of the philosophy and way of life of its people. In a very real sense these individuals, whether or not they are citizens of a particular country, are an integral part of its defense for they either constitute an internal threat, or they man the guns or participate in making its plans. General military effectiveness of a country appears to be directly related to the degree of agreement between the tactical and strategic planning and to the accepted philosophy of the inhabitants.

John Dewey, one of our country's most renowned educational philosophers, has defined democracy as a way of life and has maintained, "Democracy is the interdependence of independent individuals." This concept has been so well accepted by our educators that it has served as the basis for educational indoctrination during the past two decades. The equally general acceptance of this philosophy by our masses has imposed very confining limitations upon the military strategists in planning the necessary defense of our country against aggressor nations.

In the entire history of our country, we have not entered a single war for which we were adequately prepared. Only a very minimum number of individuals have been retained within our military service during times of peace. Our statesmen have maintained that the inference of large standing armies during peace tends to incite a feeling of distrust and thus to serve as a threat to neighbor nations. Such inferences, however, deny one's regard for the integrity and freedom of other neighboring peoples, and thus serve as a threat to real and lasting peace. Because of our belief and acceptance of this philosophy, during war we have paid heavily for our unpreparedness both in terms of lives and equipment.

During times of peace—and frequently while our enemies were preparing for war—our research laboratories and industrial facilities were busily engaged in developing and producing equipment and material so necessary to our present way of life. Such items as electric refrigerators, automatic washing machines, vacuum

cleaners, television sets, radios, automobiles, and many other items have become the normal possession of most of our people. In other countries, only individuals in the upper socio-economic levels enjoy such luxuries.

When Colonel Charles A. Lindberg returned to the United States from Europe late in the 1930s, with his now famous report on the huge Air Force and military machine which Hitler had developed in Germany, many of our defense planners challenged both his military judgment and the veracity of his statements. Many of them reasoned that a country so recently destitute from World War I could not have developed so rapidly.

Our defense planners were equally astonished at the destructive power of the Japanese armed might on 7 December 1941. In fact, in every major engagement we have marvelled at the might of our foe, indicating that only superior forces could inflict such heavy losses on our valiant men. When we have failed to accomplish our objectives, we have rationalized by attributing the cause to our over-concern for humane factors and the enemies' lack of a similar concern.

The continued survival of our nation must be attributed to:

1. Geographical location.
2. Natural defense barriers.
3. The unity of our people.
4. Our great productive capacity.

fission and intercontinental aircraft as strategic and tactical weapons makes it imperative that we re-examine our defense plans. The continued survival of freedom of man requires the inevitable interdependence of free nations joined in a common defense effort in which all men play an international role.

The Evolutionary Principle

Educators and psychologists alike attribute man's present stage of development to a principle of evolutionary growth similar to that described by Charles Darwin in his book, *The Origin of the Species.* By a process of reorganization of his past experiences, man gradually eliminates those aspects of his behavior which fail to yield satisfaction, and retains only those which yield satisfaction and aid survival, that is, man grows and develops through continuously adapting to his environment. It is based on a continuous process of natural selection and self-direction.

Through this same principle our present concept of strategic air power has emerged as our basic tactical plan for the defense and security of our country against Communistic aggression. Emerging through the cumulative historical experience of our country during times of duress and war, tempered only by our basic democratic philosophy of life, we have arrived at this concept. To understand the nucleus from which it has emerged, as well as the

The military policy which a country employs during peacetime or war, both in defensive or offensive operations, must be considered in light of the accepted philosophy of its people and their way of life

World progress in scientific developments, during, and subsequent to, World War II, by this and most other civilized countries of the world, has served to neutralize most of these factors which served as our basic defense. The war potential of late developments in nuclear

various stages of its growth, the major contributions from each of the principal wars, as they appear to be related to this concept, will be traced.

The founders of our country left their former homes primarily in search of freedom to worship God as they pleased. They

did not seek or covet the wealth or riches aggressor nations usually seek; rather, they planned to earn their keep through the toil and sweat of their brow. Because of these noble aspirations, the United States has stood as the symbol for freedom and integrity of man everywhere. During our entire history we have never deviated from these goals, even when victory during war has made such deviations easy to accomplish.

Early Colonial Wars

Most of the early settlements during the seventeenth and eighteenth centuries were located on, or near, the eastern coast, and usually on a navigable waterway. Small settlements were usually composed of individuals from the same European country who spoke a common language. The greatest number of settlements were inhabited by English speaking groups, with French groups running a close second. Smaller numbers of groups came from Germany, Sweden, Holland, Spain, and other European countries.

The primary plan for defense of this area was based on the centrally located, well fortified, stone or log fortress around which the settlement was built. The settlers themselves played a dual role as settler and defense soldier. They were self-armed, self-trained, and self-clothed. Their chief objective was to guard against the attacks of small bands of hostile Indians.

As the initial settlements grew and additional settlers arrived from Europe and later, other countries, the individual settlements gradually spread out into the frontier lands to the west. Each new settlement represented unwarranted encroachments upon the hunting grounds of the Indians. Little or no consideration was given to the native rights of the Indians. As the new settlements grew, guerrilla-like warfare spread and increased in fury and in frequency.

Out of the early colonists' experiences during war, the following tactical lessons were learned which contributed to the original nucleus of our defense concept:

1. Centrally organized defense procedures are most effective.
2. Gun-powder weapons are more effective in warfare than the Indian stone weapons and bows and arrows.
3. Single communities are not adequate for the defense against large masses of Indians.

French and Indian War

The French and Indian War was primarily an extension of a main conflict between France and England in Europe. It involved the United States because of the sympathies of the English and French speaking colonists for their respective native lands.

The French had settled primarily north of the Great Lakes and the St. Lawrence River; while the English had settled south of these waters. The major strategy of both sides during this war was designed to obtain control of these navigable waters —especially the northern approach to the St. Lawrence River.

The colonists did not maintain standing armies, but raised troops to meet the immediate situations. Usually, the grim and meagerly-furnished colonial troops supported the troops of their native country in operations in the colonies. The strategy included the auxiliary support of the French and British Navies in attaining the objectives described.

Major Russell N. Cassel wrote "Psychological Warfare," which appeared in the November 1953 issue of the MILITARY REVIEW. *His military service includes duty with the 7th Infantry Division; the Amphibian Training Force Nine; and the Fourth and Eleventh Air Forces. He was also a clinical psychologist at Bushnell and McCaw General Hospitals. He is now Editor of the* TRAINING ANALYSIS AND DEVELOPMENT INFORMATIONAL BULLETIN *of the Air Training Command, Scott Air Force Base, Illinois.*

The tactical lessons which have emerged on the basis of this war, and which are related to our emerging tactical concepts, were as follows:

1. The training of organized groups of militia is essential for effective military operations.

2. Control of the over-all military effort must be centrally directed.

3. Surprise is a valuable asset and is highly related to victory.

4. Communication between military organizations, as well as civilian organizations, is very important during war.

Revolutionary War

The Revolutionary War was a rebellion of the colonists to achieve independence from Great Britain.

The British tried to subdue the rebellion by gaining control of the Hudson River and the Chesapeake Bay; to blockade the east coast; to destroy organized military forces; and to subdue guerrilla warfare.

The total defense effort was based solely on enlistments for short durations of time. The support of the troops was a function of the local colony. Support of the French Navy was solicited and utilized effectively after the turn in the war to favor the colonists. Central control of all forces by General Washington, together with highly-developed, guerrilla-like tactics, proved too costly for the British after 7 years.

Valuable tactical lessons gained from this war may be summarized as follows:

1. A small nucleus for a defensive army is essential.

2. Centrally controlled financial support for a nation is essential for its existence.

3. Statesmen may contribute effectively to defense during war.

4. Spies are effective weapons of defense.

5. Propaganda is essential to effective warfare.

6. An offensive operation may be a defensive realization.

War of 1812

The War of 1812 was fought to stop impressment of our seamen by the sailors of Great Britain, and to force her to respect the rights of our United States as an independent nation.

During this war, the armed forces were under the control of a civilian Secretary of War who knew very little about military tactics.

We attempted to gain control of the St. Lawrence waterways and failed. We also failed to stop the British in two of their three land attacks.

Andrew Jackson with an organized band of sea pirates was able to defeat the British in their attack on New Orleans.

The valuable defense lessons learned from this war were that:

1. Adequate naval power is essential for defense of a country.

2. Civilian-military leadership is ineffective during war.

3. Well trained officers are essential to military victory.

4. Attacks against a country's capital are effective in destroying the morale of a country.

The Mexican War

This war developed because of a boundary dispute between Mexico and the United States. The American plan at first was to occupy northern Mexico.

However, this did not reduce the enemies' resistance, and General Winfield Scott proceeded by water to Vera Cruz and thence by land to occupy Mexico City, the capital, forcing the enemy to accept our terms for peace.

Defense lessons learned from this war

which have become a part of our cumulative defense plans are:

1. Supplies are essential for effective troop operations.

2. To conquer a country one must control the capital city.

3. Military training is essential for effective military operations.

4. Long-term enlistments are essential to successful war.

The Civil War

The immediate cause of the war was the secession of the Southern States. The Union Army planned to blockade the coast of the South and the major southern rivers, capture the capitol at Richmond, and then defeat the Confederate Armies in the field. The Confederate Army planned a general defensive action.

The South enjoyed a strong central command under General Lee during the entire war with effective long-term conscription of troops, and with little interference by high-level statesmen. On the other hand, the North had much interference by the statesmen designed to ensure defense of the capital city and the continued policy of short-term enlistments. It was not until the command was finally given to General Grant, and until after the South invaded deep into Northern territory, that the North rallied effectively to support the defensive program, and the tide of battle was overwhelmingly changed.

Valuable defense lessons learned in this war may be summarized as follows:

1. Enlistment of military personnel must be supplemented by conscription.

2. War on the home soil is very costly and should be avoided.

3. Reconnaissance troops are essential to military operations.

4. A nation's industrial potential is a main determinant of ultimate victory.

5. Railroads are indispensable to war.

6. A nation must be united to wage effective war.

The Spanish-American War

The War of 1898 was caused by the sympathy of American people to the ill-treated neighbors in Cuba. It was primarily a naval war with secondary army support. Our military units were superior in size to the enemy, but our equipment was very antiquated. Valuable lessons which have contributed to our defense planning may be summarized as follows:

1. Effective military operations demand up-to-date equipment.

2. Disease must be controlled for effective military operations.

3. Military superiority is not dependent upon numbers alone.

4. Unpreparedness is costly to a nation.

World War I

The repeated attacks of German submarines upon our Merchant Marine fleet brought about our entry into World War I. For 3 years before the United States entered the war, almost the entire world was engaged in the war, and it appeared that we held the balance of power needed to determine victory.

This was the first war in the history of civilization which utilized mechanized equipment, tanks, airplanes, machine-guns, extremely large and accurate artillery, gas warfare, submarines, and a host of other new inventions and tactics. The Allies put 40 million men in arms against the Central Powers' 20 million. Almost 9 million lost their lives and 20 million were wounded. Nations large and small incurred huge debts and suffered staggering losses, both in equipment and men.

The tactical lessons which have been gained from this war may be summarized as follows:

1. Co-operating forces needed unified commands.

2. Mechanized warfare was far superior to older methods.

3. Poisonous gas yields only paradoxical advantages.

4. Peace is often lost by the victor at the peace table.

5. General disarmament of all nations is essential to peace.

6. A common language for communication is the strongest bond two nations can have.

7. Imperialism is a direct cause of war.

8. A country's veterans constitute a major political force.

World War II

Many of the countries of the Central Powers of World War I felt badly about the losses and humiliation received at the peace table of the Allies. During their reconstruction periods, a number of leaders who appeared to be mad for conquest, revenge, and power managed to get control of such countries as Russia, Germany, Italy, and Japan. When their demands for a return of some of their previously held possessions were refused, they set out to take them and additional ones by force.

The United States sought tactical means for gaining sufficient time to bring the full effect of industrial production to bear on the battlefield. The cold war (psychological warfare) and strategic warfare were new additions of this war, and especially the use of guided missiles, paratroopers, and the atom bomb.

Valuable tactical lessons learned from this war were as follows:

1. The value of guided missiles.

2. The value of jet air power.

3. The value of psychological warfare.

4. New and improved drugs for the control of infection.

5. The value of basic and applied research to successful combat.

6. The need to provide a sanctuary for enemy escapees friendly to our own cause and beliefs.

7. The need for an international people and a United Nations body for control of the armament of all nations.

Strategic Air Power

The birth of *strategic air power* may be traced directly to 21 July 1921, when General William Mitchell sank the German battleship *Ostfriesenland* using seven 2,000-pound bombs. Thus, he demonstrated the value of air power in combat. In the early part of World War II, it was demonstrated more effectively by the allied bombers in Europe.

In 1945, the atomic bombing of the Japanese homeland caused a nation with a huge well-trained and well-equipped Army to sue for peace without an invasion of their country.

The history of the *strategic air power* concept may be traced to the cumulative growth and development of the defensive and offensive tactics of our country since the beginning of the country.

Surely by now we have learned the lesson taught by Armistice Day—and by Appomattox, by VE-Day and VJ-Day, by the end of active hostilities in Korea. Surely we realize now that peaceful intentions are not enough; that the effectiveness of our diplomacy can be no greater than our ability to back it up with military force.

General Matthew B. Ridgway

TERRITORIAL WAR
THE NEW CONCEPT OF RESISTANCE

Lieutenant General Dushan Kveder
Assistant Chief of Staff, *Yugoslav Army*

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THE last war taught military leaders an important lesson about the nature and scope of resistance movements in occupied countries. Up to that time, countries threatened by aggression had prepared to defend their territories by offering frontal resistance along their national borders. Taking advantage of superior strength, the aggressor smashed this kind of resistance in one country after another. Motorized columns quickly penetrated the frontiers, drove wedges deep into the interior, cut off entire regions, and encircled parts of the defending forces. Thereupon, isolated commanders surrendered and entire units threw down their arms or were annihilated. When the army had fallen to pieces, the enemy completed the occupation of the country with relative ease, often aided by an official policy of surrender brought about by fifth columns, treachery in government circles, defeatism among military leaders, and personal and political antagonisms of various kinds. Thus it was that Poland, Denmark and Norway, Belgium, the Netherlands and France, Yugoslavia and Greece, were taken over one after another. Only a few units succeeded in withdrawing behind the allied lines to continue the struggle outside the national territories. Most of the occupied nations, depressed and demoralized, accepted conquest as inescapable.

As the war continued on a worldwide scale, however, the occupied nations emerged from their bewilderment. Gradually they became aware that defeat at their frontiers had not ended the war; slowly they resumed active resistance. In many countries, however, this movement did not gather momentum until the very end of the war, and was restricted mainly to economic sabotage. Since these resistance movements avoided open clashes with the enemy's armed forces and did not utilize their large reserves of manpower, they had little strategic significance.

The political reasons noted above which made resistance ineffective were compounded by an almost inconceivable lack of understanding by allied military leaders of the military value of continued combat in the enemy-occupied nations. The initial mistake was the voluntary surrender of the trained armies, with their commanders, weapons, and equipment. No attempt had been made before the war to lay the foundations for a continuing war of liberation against the invader, and new armed forces had to be improvised within the occupied countries at the cost of great suffering.

There is no doubt that the possibilities

of a liberation movement were more fully developed in Yugoslavia than in any other country during World War II. Yugoslav resistance was not limited to economic sabotage and small-scale guerrilla activities. It showed that an occupied nation can wage a real "territorial war" with large-size regular units and achieve the country's final liberation with its own forces.

Is this lesson of World War II understood today, when again there is a danger of war? At present, several European countries have realistic programs for frontal defense in case they are attacked. And, of course, it would be senseless for countries whose frontiers coincide with the North Atlantic Treaty Organization (NATO) defense line—and especially those which have strong armies of their own—to plan to abandon frontal resistance and to hand over their territory and their administrative and industrial centers without fighting. Such nations have every reason for attempting to repel aggression at their border areas and planning a counteroffensive that will crush the enemy on his own soil.

The fact is, however, that most European countries do not as yet possess the material resources required to make this the *only* possible concept of defense. And in many cases the concept of a frontal defense at all costs could have fatal results, leading only to the situations of World War II would lose their armies, their military organization, their weapons, and their morale. To admit that some West European countries might be occupied does not imply pessimism or defeatism. We know too much about the ratio of forces which the two hostile blocs could put in the field to preclude the possibility of occupation for any country. Facing that possibility realistically and courageously, each threatened country must decide what concept of defense it should adopt, and what kind of war it should prepare to wage in order to avoid surrender if a superior enemy penetrates the country.

In the first place, each country should provide for a planned withdrawal to prepared lines or zones where frontal resistance can be continued. In the final analysis, this objective might also be attained by withdrawal to the territory of one or several allied countries. World War II has shown, however, that often this cannot be done. Only a powerful army can execute a successful frontal withdrawal before a superior enemy. Moreover, it is not proper to leave unarmed people at the mercy of the invader as was demonstrated. This means that a country unable to withdraw its forces to allied territory will be faced by two alternatives—either to surrender, or to wage the war in a new form suited to the changed military situation and the new relationship of forces.

If an aggressor is cognizant of the fact that his aggression may lead to a prolonged, territorial war, which will be waged over the entire area of the country concerned, he will consider the results of his acts

1939, 1940, and 1941. Such suicidal undertakings would undoubtedly provoke world-wide admiration; but they would do a disservice both to the countries attempting them and to the system of world defense against aggression. The nations thus defying one of the major lessons of

Surrender is an act of national disgrace which demoralizes the people and paves the way to collaboration with the enemy and to various forms of treason. The nation loses something even more important than territory—it loses its army and, thereby, the means for regaining its liberty

and its territory. And most important of all—given the ultimate perspective of victory by a coalition in the war—surrender by an allied country (or indeed even of a neutral overrun by the same aggressor) harms not only the country itself, but the general allied cause as well, for it unnecessarily postpones the hour of victory. The Liberation War in Yugoslavia showed unequivocally that manpower is fundamental to victory and should be valued above territory. No territory can be maintained if the army is lost; any territory can be regained if the army remains. The collapse of the front need not, therefore, be followed by surrender, but only by a change from classical frontal war to mobile territorial war. Present-day European armies must envisage waging both types of warfare. Only thus can each country prevent the rout of its army in the event that frontal warfare on its own territory becomes hopeless.

Characteristics

Since history has thus far provided no example of a transition from frontal to territorial warfare, many military leaders and theorists may view these ideas skeptically. But there cannot be a precedent for every event that takes place. And history has shown us examples of territorial wars, even though these developed on a different basis than by a direct transition from frontal war. In its final years, the Liberation War in Yugoslavia became a genuine, territorial war on a large scale. Since it demonstrated the usefulness of this type of war, both for the people of the nation being attacked and for the strategy of the coalition in general, let us now examine its characteristics in rough outline.

Lieutenant General Dushan Kveder is Assistant Chief of Staff of the Yugoslav Army. He was one of Tito's Partisan leaders during the period 1941-45. General Kveder was a former student at the Voroshiloff Academy in Moscow.

A Regular War

In the first place, the Yugoslav experience shows that under present conditions territorial war is no longer merely a "little war" (although it includes the typical activities of a little war), but is a genuine "great war." It cannot be referred to simply as a "partisan war," because this name designates the actions of small units, usually carried out in support of a regular national or allied front. By territorial war in the modern sense we mean an *independent* war or, at least, a war which is an integral part of the general coalition war.

A modern territorial war is a *regular* war. All Yugoslav units, from the smallest to the largest, were directed from one center and conducted their operations in accordance with the principles of regular warfare. The operations of the larger regular units are the dominating element, and will be so from the very beginning for armies which switch from frontal to territorial warfare. In armies formed after the occupation has taken place, as was the case with the Yugoslav Liberation Army, they appear only in the later stages, but at last they become the dominating element. Part of this process took place in our army in 1942; it was completed in 1943.

To enable the larger regular units in Yugoslavia to survive and operate, it was essential to co-ordinate their actions with those of the small—also regular—local partisan detachments and sabotage groups throughout the countryside, along lines of communication, and in the towns. An army waging a territorial war, therefore, consists of two parts: large regular units to carry out the bigger operations, and many partisan and diversionary groups for auxiliary actions. While the larger units engage the main mobile forces of the enemy, the small partisan groups scatter the enemy and pin him down over the entire territory. Even at the end of 1944, when

our army had switched from territorial to frontal warfare and had 51 divisions at its disposal, we still had 107 large partisan detachments and countless small diversionary groups. They proved very useful.

Modern territorial warfare is characterized by the fact that it is waged by large regular units. These units—regiments, brigades, divisions, and army corps—may be formed in the course of the war itself, as in Yugoslavia; or, if an army switched directly from frontal to territorial warfare, would be the same units that existed previously, although lighter and more mobile. The operations carried out by these units are no less important than those of frontal warfare. They are not merely skirmishes between partisan groups and enemy patrols or police. A large number of divisions may participate on both sides. In Yugoslavia, both sides used artillery, tanks, and planes.

Experience proved beyond question that even when most of a country's populated centers and communication are in enemy hands, units as large as divisions and corps cannot only exist and operate, but also fight and win more easily than smaller ones can in such warfare. Nor is this experience contradicted by the fact that our wartime divisions were somewhat smaller than normal (3,000 to 5,000 men, or less; in the last year of the war from 8,000 to 10,000 men). Had we had more supplies, the units could have been larger and their victories greater.

The term territorial war is appropriate for this special form of regular war, since it implies that the warfare is waged over the *entire* territory of the country, and not merely along a more or less unbroken line. This, of course, determines only the basic strategical and tactical conceptions of the military operations. Their political substance represents a liberation war; although a liberation war is not necessarily "territorial." It can also be a "little" war—guerrilla warfare. A liberation war will be a regular territorial war only if it is waged mainly by large regular units.

Rigid and clearly-defined fronts are not typical of territorial war, although they may appear in the course of it in flexible, modified forms. This is especially so during the final phase, when the enemy is being expelled from the country. Along with the use of the entire national territory, free maneuvering is characteristic of territorial warfare. The larger units operate now in one area, now in another, while the smaller detachments cover the entire territory with their guerrilla activities. Wherever large regular units appear, liberated territories are formed; these may often be abandoned, to be formed again somewhere else. At times all the forces on both sides are in movement and in action. Then the liberated areas practically disappear: but almost all the "occupied" areas disappear likewise. The two armies find themselves enmeshed in a huge no man's land, but with all movements on both sides more or less centralized and directed according to plan. Such, approximately, was the way the fighting looked during the sixth enemy offensive in Yugoslavia.

An Organized War

A territorial war in a civilized country is an organized war directed according to plan. In its general outline the command is expressly centralized, although in detail it leaves much more independence and initiative to the subordinate commanders than is the case in frontal warfare. This single and centralized command gives regular territorial warfare its strength and advantage over the nonregular "little" war.

In territorial war, discipline must be as firm as it is in frontal war—or firmer. It is based less on formal regulations and coercion than on a profound consciousness of duty on the part of officers and

soldiers, attained only by tireless indoctrination. The more disciplined the unit and the better organized its activities, the greater its effectiveness and the smaller its hardships and losses. All tendencies toward disorganization, anarchy, plundering, and arbitrary action must be firmly checked since they weaken the resistance, lower the prestige of the army in the eyes of the people, and reduce the prospects of success in battle. In this respect, we in Yugoslavia were not sentimental.

Territorial war is not, and must not be, a disorganized affair on the principle of "every man is on his own and should shoot at the enemy when possible." That form of resistance requires sacrifices out of all proportion to enemy losses. Naturally, if no organized insurgent army exists, the people themselves may spontaneously take up arms to protect themselves and their homes, thus beginning an insurrection. Under such conditions, this is useful. But we learned that spontaneous uprisings are doomed to failure unless a military organization is set up in time and large military units formed.

Political and Ideological

Even during World War II, territorial wars were more political and ideological in character than the frontal war conducted by the great powers. They will be even more so if there is another conflict. This political emphasis finds expression not only in the fact that the outbreak of war is closely linked with political events in individual countries and in the world, but also because in a liberation war the smallest tactical actions are bound up with the specific political problems of an area at a given moment. All battalion and even company commanders, and especially the leaders of partisan detachments, must independently solve many political problems; their military actions cannot otherwise be intelligent or efficient. This is a necessity which cannot be avoided in such a war, regardless of the desire of many officers in European armies to refrain from politics in the exercise of their military profession.

The decisive role of morale in wartime is nowhere so obvious as in a liberation war. How otherwise explain the victory of the Yugoslav Liberation Army, which fought under exceptionally trying circumstances against an enemy enjoying great material superiority? In the world as it is today, only a country which has solved its basic social and national problems to the satisfaction of the people—or, at least, shows that it is in process of solving these problems—can find within itself sufficient moral strength to fight in this way. A liberation movement must mobilize the people; its army must win the day-by-day support of the civilian population, especially of the peasants, for without them neither a large territorial war nor a small partisan war can be fought successfully. A territorial war is a people's war. In such a war it is very difficult to use coercive measures. Further, women and young people play very important roles and increase its mass character.

In his work *On War* (Volume 6, Chapter 26), Clausewitz called liberation wars against invaders "people's wars" and referred to those who opposed such wars because they allegedly offer as great a threat to the domestic regime as to the foreign enemy. Such views are shared even today by some persons in the ruling circles of various European countries. But the liberation movements in the last war showed that no social class or political group has reason to fear for its position if it is resolute in the struggle against an invader. The masses of the people will rally against the occupation and, indeed, nothing can prevent them from doing so. In every nation those who lose their influence and position are those who remain aloof; and those who are destroyed with the enemy

are those who have struck bargains with him.

The struggle against the fifth column is of exceptional military importance in a liberation war. Without a fifth column, the invader is blind and powerless. The problem cannot be solved merely by dealing a heavy blow at enemy agents at the outset. The logic of the occupation itself creates new forms of fifth columns. Even people who seemed to be perfectly reliable in peacetime can turn out to be faint-hearted and opportunistic. There are always speculators and egoists who put their private interests above the interests of the nation, working for the enemy at first, perhaps, as neutrals, then as petty collaborationists, and, finally, as traitors and spies. It is not a long road from the weakling's first tacit acceptance of the inevitability of the occupation to the moment when the invader puts a rifle into his hands to use against his own people. The fifth column cannot be defeated merely by military action which seeks to annihilate it physically; that action must be backed by a persevering and intelligent political struggle which aims to destroy it ideologically and morally. Even in a pre-war period, such political action is a most important part of the preparation for territorial war.

A territorial war is always characterized by violence, terror, and reprisals on the part of the invader. It claims its victims not only in the fighting ranks, but also among the civilian population. In this respect it does not differ from a classical frontal war, with its atom and other bombs, guided missiles, and chemical and biological weapons. Civilian losses are today an inevitable accompaniment to every type of war.

There are no guaranteed methods of preventing casualties at the front or in the rear in any type of contemporary warfare. The Yugoslav experience showed, however, that in territorial war there are reliable ways of reducing the number of casualties. The best way to protect the adult male population from reprisals is to draft these men into military units or, at least, to arm them as Home Guards for local self-defense. Reprisals then become much less likely. The active participation of women, and, especially, young people actually guards them from danger rather than exposes them. We learned that the surest method of preventing the unlawful shooting of prisoners of war is to hold enemy prisoners. And the most efficient method for preventing reprisals against women, children, and old people is to increase the activity of armed units and to spread the uprising. When the enemy realizes that the slaughter of hostages only increases the resistance of the population and spreads the insurrection to other areas, he begins to question its usefulness. This experience carries an international lesson. If the resistance is intensive in all occupied countries of Europe, each nation will pay a proportionately smaller price for the common victory.

Density of Forces

In preparing for territorial resistance, it is necessary to assess realistically the ability of the invader to control "occupied" territories. Our experience in Yugoslavia demonstrated that wherever we maintained large units, the invader required at least a reinforced battalion to man one garrison. Smaller garrisons, and especially small *gendarmerie* stations, were marked out for certain annihilation. The density of the occupation forces in a given area was always in proportion to the strength of our army. Where only small partisan detachments were operating, the enemy kept small garrisons, making it easier for him to control the area. Where larger units of our army were operating (especially when they were armed with heavy weapons), the enemy reduced the number of garrisons but increased their size. This

allowed our units greater freedom of maneuver, liberated territory, and increased the security of the population.

This rough yardstick that the enemy requires one battalion for every garrison, provides an illustration of what may take place in such a country as Switzerland, for instance, if an invader had to fight a territorial war there. Nine enemy garrisons would require an enemy division. And how many cities and industrial centers, towns, and large villages are there in Switzerland? Hundreds. Would the enemy be able to devote so many divisions to the occupation of this one country? Obviously not, for there would still be the regular front of the great allies; and in all the other European countries he would be faced with the same problem. Besides, the enemy would need divisions and even armies to keep down the Russian and satellite peoples. The result would be that in Switzerland, and in every other country that was fighting a modern territorial war, there would be large free territories, free towns, and even cities. The resistance could carry out all kinds of operations, large and small, organize its intelligence and communications, and supply its army.

On the other hand, a nation which surrenders can be held with the aid of a few *gendarmes* and domestic agents, perhaps with a few mobile police regiments in reserve, especially if its government administration enters the service of the aggressor. Under modern conditions of territorial resistance, then, occupation is a relative matter. Actually, an entire national territory can never be occupied. The greater part of the population and large parts of the national territory will always remain free if the people and their army will it so.

The operational basis of a territorial war is not in the towns but in the countryside, that is, in open areas that no occupation, no matter how heavy, could control. The existence of such areas made it possible for Yugoslavia to transform the original partisan army, consisting of 92 detachments with a total of 80,000 fighting men in 1941, into a large regular army totaling 53 divisions with 800,000 fighting men in 1945. But this countryside is only a kind of rear for the units, whose operations are in the main directed against towns with large enemy garrisons. This should not, however, reduce the importance of creating armed groups within the towns themselves. These groups are also a significant force in territorial warfare.

Size of Area

Yugoslavia's relatively large area (approximately 97,660 square miles) gave our units great possibilities for concentration and dispersal, permitting the transfer of troops from one area to another for surprise offensive and flexible withdrawals. Would territorial war be impracticable in countries of smaller size? A more detailed study of our experience indicates that similar maneuver is entirely possible even in small areas. The Yugoslav province of Slovenia covers approximately 7,600 square miles, or about half the area of Switzerland. This province was in a special position since parts of it had been annexed directly to the Third Reich and other parts to Italy. The enemy was very sensitive about what went on there. Moreover, the main lines of enemy communication crossed the province, and the Slovene units had specific tasks to carry out. In view of this, Slovenia had more autonomy in waging the war than did the other provinces and Slovene units seldom operated in other provinces. Throughout the war, in spite of hard-hitting enemy offensives using large numbers of troops (almost 100,000 Italians, for example, took part in the third enemy offensive in Slovenia), the Slovene units never were compelled to abandon their operational territory and withdraw to other parts of the country. When sometimes they crossed

over into neighboring Croatia, it was to help the Croat units execute certain large-scale operations, after which they again returned to Slovenia. The Slovene commanders never felt that the narrow limits of their province did not provide sufficient maneuvering space for fighting and means of subsistence.

In another war, almost all the European nations which have the misfortune to be occupied will, as a result of the experiences of the last war, conduct at least a small territorial war, if not a large one. In these conditions, each insurgent will find support in neighboring countries, permitting some military units of one country to find shelter for a time on the territory of another. Often during the last war the Italian Garibaldi-Nattitsone partisan division, which operated in Friuli in northeastern Italy, was given shelter by our Slovene units, and in the same way Bulgarian partisan units often sought refuge in eastern Serbia.

Terrain

In western Europe one often hears that mountainous terrain is essential for success in territorial war. The facts do not bear out the thesis. In the first place, Yugoslavia is not predominantly mountainous, since 54.8 percent of her area is less than 1,600 feet above sea level and a further 27.4 percent lies at an elevation of between 1,600 and 3,300 feet—a total of 82.2 percent of rolling terrain suitable for maneuver. There is another 14 percent of moderately mountainous land (3,300 to 4,900 feet in altitude) which, from the military point of view, is not essentially different. Steep mountains (4,900 to 6,500 feet) cover only 3.3 percent of the area, with really high mountains (above 6,500 feet) accounting for the remaining .5 percent. Partisans thus fought on a terrain all but a fraction of which is suitable not only for operations by infantry units armed with modern weapons but also for actions by motorized troops, tanks, and all sorts of artillery, as well as for the establishment of air bases. And indeed, our experience never gave us reason to believe that it is easier to wage partisan or territorial war in the mountains than on intermediate terrain. On the contrary, our fighting men always considered high mountains an uncomfortable and difficult battlefield and avoided them whenever possible. Furthermore, in the mountains, where there was no enemy, the partisans had nothing to do and no one to fight. Their function was to fight and they could do that only where the enemy could be found: on the plains and at lower altitudes.

Population

There is also a belief in western Europe that it would be very difficult to conduct a territorial war there because of the density of population, the proximity of settlements to one another, and the well-developed network of roads. Extreme density of population on almost absolutely flat areas certainly hampers large-scale operations. However, most European countries do not belong in this category, or at least not entirely. Yugoslavia has 223 inhabitants per square mile, with one part less densely and another more heavily populated. Operations were carried out in both, but especially in the more densely populated areas. Again the experience in Slovenia is instructive. In Slovenia, there are 183 inhabitants per square mile, which makes it not different essentially from the military point of view from, for instance, Switzerland with approximately 290 inhabitants per square mile. In Slovenia, all kinds of operations were carried out by units which by 1943 had grown to 2 army corps consisting of 6 divisions, 3 independent brigades, and approximately 15 partisan detachments of several hundred fighters each—a total of from 35,000 to 40,000 fighters. The density of

the population never was an obstacle to these operations. On the contrary, our units always strove to penetrate the richest areas, where the enemy usually put up the strongest defense but where living and fighting conditions were better: food more plentiful, equipment easier to get, recruits more numerous, care of the wounded easier, and organization of communications and intelligence simpler.

In Slovenia it is difficult to find a point more than 16 to 24 miles from an automobile road. The roads were useful to the enemy but they were useful to us, too. When we wanted to prevent the enemy from using them, we had means at our disposal to do so. A concrete example: six parallel automobile roads lead from Ljubljana to Celje, through a gap of 32 to 48 miles wide between the Sava River and the Kamnik Mountains—that is, one road to each 5 to 8 miles. No point on this terrain is more than 5 to 8 miles from the nearest road. The entire terrain is heavily populated. The Kamnik-Zasavje Detachment, numbering 100 to 200 fighters, fought in this area from 1942 until the end of the war, operating as a whole and never breaking up into smaller units. It constantly attacked lines of communication and convoys. It withstood at least two enemy drives a month. Yet the enemy never succeeded in driving it out of this region. These and many other similar examples taken from actual practice should be convincing evidence that territorial war can be waged in any country with a similar network of roads.

Standard of Living

Was the relative backwardness of prewar Yugoslavia responsible for success in this new form of war? In the first place, it might be noted that a relatively low standard of living does not in itself cause a liberation movement to develop. If this were so, it would be hard to understand why the Bulgarians or Romanians—whose living standards did not differ much from those in many Yugoslav provinces—did not develop any important resistance movements against the Germans, although they had as many reasons for it as we did. Besides, in the last war, troops of many highly-civilized nations fought under conditions which were no easier than those under which Yugoslavs were fighting—for example, the British soldiers in the African deserts or the Americans in the jungles of the Pacific. The men of the French resistance fought bravely; if they were not as effective as they might have been, this was not because of the degree of their civilization but their general conception of the struggle and the tasks they had set themselves. In Yugoslavia before the war, all the provinces had not reached the same level of development. But there was no essential difference between the standard of living in Slovenia and the other countries of western Europe. And yet, the Slovenes fought no less well than the other nationalities of Yugoslavia. Explanations of the will to fight in men must be sought elsewhere than in criteria of "civilization" or "backwardness." In my opinion, any nation could fight a territorial war in the future, regardless of its state of development, provided it possessed a high degree of national consciousness and devotion to freedom and independence.

Weapons Needed

What kinds of weapons are needed for territorial operations? The three basic requirements are suitability for maneuvering and extreme mobility, for hard and rapid blows, and for fighting at close range. Therefore, these are needed: first, light weapons, easy to carry; second, weapons of high destructive power, capable of strong and sudden concentration of fire; and third, weapons of somewhat less than ordinary range. It is quite incorrect that forces in a territorial war, including partisan units carrying out aux-

iliary activities in the enemy rear, should be armed merely with light infantry weapons. Certain new armaments developed during and after the last war will greatly facilitate the waging of territorial war in the future—among them are antitank rocket launchers, recoilless guns, and infrared sights for firing at night. They will help solve three important problems which have to be faced in territorial actions, namely antitank fighting, destruction of fortified points, and effective firing during night operations.

Air Force Role

Special attention must be drawn to the extremely important role of the air force in this type of war. In essence, modern airborne troops employ simply the typical methods of territorial war. In the last war, with a few exceptions, the possibilities of using airborne troops were not fully utilized. One reason was that they were overburdened by various requirements arising from the principles upon which frontal warfare is waged, and hence were not flexible enough for use in territorial operations.

The opportunities for using them—especially in one's own occupied country, or in a friendly country—are much more extensive than is usually believed. If they adopt appropriate tactics, the length of their survival in the enemy rear need not be limited. This was proved by Yugoslav divisions which operated for years in the thick of enemy forces. Even smaller airborne units such as battalions and regiments can accomplish a great deal if they use clever tactics and are armed with good weapons.

Transport aviation adds greatly to the mobility of land units in territorial warfare. Besides performing marches and infiltration, such units will, in the future, be able to make use of air transport in their maneuvers. The possibilities of surprise through the rapid transfer of the main effort from one area to another will thereby be greatly increased. Transport also plays an important role in evacuating the wounded and sick who are a particular burden on the field forces in territorial warfare. In the course of the fourth enemy offensive against our main forces in Bosnia and Hercegovina, for instance, Yugoslav units were compelled to carry with them 4,000 wounded and sick (mainly typhus cases), which greatly hampered the operations against 11 German and Italian divisions. On the other hand, when the allied air forces evacuated several thousand wounded to southern Italy at the end of 1944 and the beginning of 1945, the burden on our units was greatly relieved and their fighting morale was heightened.

Combat aviation is very important for carrying out more difficult tasks, such as attacking fortified positions and defending one's own forces from attack by superior enemy concentrations. Difficulties in using artillery and tanks—ever-existent due to the very nature of territorial war—can be lessened through the close co-operation of air forces. Aviation is useful for liaison work between various commands, and renders possible more frequent personal contact between commanders. It also can be an important source of supply, especially as regards materials which are difficult to capture from the enemy.

For these reasons every country which seriously considers the possibility of engaging in territorial war must build up its aviation, and particularly its transport aviation. In this connection, the great usefulness of helicopters must be emphasized. They open up new prospects, especially with regard to supplies and evacuation. The problem of airfields for transport aviation should not cause too much concern. If the transport aviation cannot temporarily be based on one's own territory, it can be based on neighboring allied territory. Units on "occupied" territory

will always be able, with a little resourcefulness, to set up makeshift airfields as we used to do (although disappointingly few planes came to land on them).

Supply

Foreign armies which are considering the possibility of territorial war on home ground always have misgivings about being able to supply their units, especially with ammunition. This is certainly a difficult problem, but our experience has shown that there is a remedy for this also.

There was no continuity of organization between the old Yugoslav Army and the new Liberation Army. The latter was formed on a completely new basis. At the very beginning, the weapons and ammunition which had been hidden, both by our underground organizations and by individuals acting on their own initiative when the old army disintegrated, proved to be extremely valuable. The quantity was small, but enough with which to begin. The weapons and ammunition already in the possession of a regular army at the time of transition from frontal to territorial warfare are likely to be sufficient at the beginning—and if a territorial war is planned in advance, there will have been ample opportunity to prepare reserves of material and to store them away in hiding places for months and even years of war. In this connection, it must be kept in mind that less ammunition is used, and less should be used, in a territorial war than in a frontal war; troops should think twice before firing a round or a shell.

In Yugoslavia we built up an army of 300,000 armed men before receiving from the allies a single rifle or a single round of ammunition. We armed them exclusively with weapons captured from the enemy. Only in the second half of the war did we begin to receive aid from abroad, but this was never sufficient to cover our needs. War booty was our main source of materials until the end of the war. It is to be hoped that in a possible future war, the liberation armies will receive more aid than in the last war. It would, however, be erroneous to count on this source alone, since it cannot be sufficient. The major allies will have the problem of supplying their own armies. Moreover, let us hope that the number of people carrying on large-scale resistance will be larger. And there are bound to be shortages of transport planes and pilots, as well as interference by enemy planes. Liberation movements in a future war must be prepared to rely at least partially upon their own resources.

If the war lasts a long time, it may become necessary to rearm the fighting forces in part. To the extent that there is a shortage of ammunition for their own weapons and calibers, resistance forces will have to adopt enemy weapons and calibers. "Standardizing" armaments will occur in a new form—in accordance with enemy calibers. This would be unthinkable in a frontal war, but is quite natural in a territorial war.

The Future

A soldier who received his training during the last war in the school of partisan warfare cannot help regarding present Western defense conceptions with certain misgivings. He must, of course, admit the great value of large divisions equipped with modern arms, powerful weapons for fire support, strategic aviation, atom bombs and atomic artillery, guided missiles and other up-to-date armaments for resisting the aggressor frontally and disorganizing his rear. Along a conventional front in a possible future war similar armaments will no doubt be basic for defense and counteroffensive. But the tendency to underestimate the military importance of resistance by nations which have fallen under enemy occupation, and to think of it only as insignificant auxiliary action by guerrillas and saboteurs,

seems shortsighted. The strategic value of liberation wars seems to have been underestimated in Western military planning; not enough is being done to prepare for organized resistance by nations which, owing to their exposed position, might be occupied, at least temporarily. In estimating the relative strength of the Eastern bloc and NATO, the supposition appears to be that all the enemy divisions will be used on the conventional front. But the number the enemy will put there can be considerably reduced by compelling him to fight a territorial war in any nation he overruns. If the assessment of the situation overlooks these huge reserve forces, it may weaken Europe's defensive power.

A widespread liberation war has immense strategic importance. In the last war, Yugoslavia prevented the dispatch of any of her own quisling units to other fronts, reduced to a minimum the enemy's ability to draw on the country's production for his own needs, and pinned down over 30 enemy divisions, with more than half a million men. At the end of 1944, for instance, the enemy was compelled to put 40 of his divisions with 580,000 men into the field against 51 Yugoslav divisions and 500,000 men. At the same time, on the Italian front there were only 27 to 28 Axis divisions, consisting of 350,000 men, fighting against 24 allied divisions.

The prospects of *final* victory in an eventual new world war are on the side of the forces united against aggression. This perspective is based not merely on their greater economic resources which may have a decisive influence, but also on their moral advantages in a war which they have done nothing to provoke. Confidence in final victory will give tremendous moral support to all nations that are attacked, including those which might be temporarily occupied. But it cannot by itself maintain the morale of European nations threatened by occupation. They cannot nourish their fighting qualities solely on the hope that, if occupied, they will be freed from the outside. Indeed, that attitude tends to lull a nation's fighting spirit rather than stimulate it. A threatened nation must be made aware that it can defend itself successfully with its own forces and that it should not expect to be rescued by someone else. It must find strength for the struggle within itself; must develop reliance on its own possibilities. Only such a nation can withstand aggression, occupation, terror and reprisals, and win back freedom and independence. If it does, it thereby makes a vital contribution to the joint victory over the aggressor.

A liberation war can be improvised, as Norway, France, Italy and other occupied countries showed in the last war. Even in Yugoslavia, the military organization had to be set up, by and large, during the war itself. But it was a difficult, long, and painful road, exacting many victims. If the former Yugoslav Army had made any real preparations for prolonging the war against the invader, our Liberation Movement would have developed under much easier circumstances. Victories could have been won more quickly had we started with a situation similar to the one we had created by 1943, for instance, instead of starting under the conditions of 1941.

Psychological Preparation

A new solution to the problem of organizing in advance for territorial warfare should not be sought in the formation of units of a special type, however. The entire army to be used in frontal operations should be trained both for frontal and territorial war, since it is difficult to determine in advance which units will be left behind the enemy lines. Formation of special partisan detachments and groups of saboteurs, detailed to specific areas, is justified, however.

Psychological preparation also plays a very important role. Before the last war,

one often heard naivé views to the effect that any preparation for occupation, or even talk about the possibility of failure in the frontal resistance, would spread defeatism in the army and among the people. The unrealistic appraisal of the relative forces and the underestimation of the need of preparing for a territorial war were concealed behind talk of the absolute invincibility of this or that nation and the certainty of smashing the enemy by offensive action. And this, in fact, was a tacit admission that the failure of frontal resistance would mean the end of the struggle and the beginning of capitulation and slavery. But a breakthrough by the enemy need not mean the end of all fighting, and least of all does it mean the end of the war; it simply means a transition from one form of warfare to another. True, this is a much more difficult and sanguinary form, but the better and more complete the preparations for it, the less bloody and difficult it will be. Preparations for territorial war in peacetime do not, therefore, spread defeatism in the army and among the people, but open new vistas for saving national honor and independence. Further, they act as a curb on a would-be aggressor and thereby serve the cause of peace. For if an aggressor is sure that by liquidating the frontal resistance of a country, especially a small one, he can destroy all further resistance and compel surrender, he will not hesitate to commit aggression at the convenient time. But if, on the contrary, he is convinced that after occupying the country he will have to fight a terrible, exhausting, and prolonged territorial war, over its entire area, he will seriously reconsider the advisability of attacking. Territorial war thus represents a tangible and convincing inducement for a would-be aggressor to respect peace and shun war.

Ours is a superbly trained Army, ready to fight on any terrain, under any circumstances whenever it may be called upon to do so. It is one of the toughest, most efficient, fastest moving armies ever known. Day by day it is becoming tougher and its striking power and mobility are becoming greater. Every activity that does not contribute to combat effectiveness is being eliminated. Although the fighting has ceased in Korea, the pace of training has not been slowed. New and improved weapons of unbelievable variety—both atomic and conventional—are giving our forces a punch which only a few years ago seemed beyond achievement. From bottom to top it is a hard-muscled, tough-minded Army, well trained and superbly led.

Secretary of the Army Robert T. Stevens

LEADERS WANTED

First Lieutenant James C. McCullough, *USAR*

The views expressed in this article are the author's and are not necessarily those of the Department of the Army or the Command and General Staff College.—The Editor.

IF A MILITARY commander of ancient times could return, he would be astounded at the changes in the science of warfare. Modern weapons, tactics, and the entire scope of war would be entirely new to him. But he would soon discover that one aspect of military science has not changed—the importance of good leadership. New methods of warfare have not diminished the value of leaders. They have, on the contrary, made good leadership more important than ever before.

Let us examine the quality of leadership as it pertains to the Armed Forces. Perhaps the simplest definition for our purpose is, "Leadership is the capacity to obtain voluntary effort and the teamwork of a group."

We cannot hope to learn much about leadership merely from listening to or memorizing a brief definition. Many separate and distinct human characteristics are involved in leadership, and not all persons who become leaders possess all the same qualities. Later, we will consider some of the qualities a leader *must* have, along with other qualities that have helped many leaders to outstanding success. For the present, however, it is sufficient to define a leader as a person who can influence others to contribute their best voluntary efforts toward a common objective.

There are two main schools of thought on this question. One theory is, that some persons are born with a natural gift for leadership, and that those born without it can never become leaders. The other theory is, that almost any person of normal intelligence can learn to become a leader in the same way he learns to solve other problems of life.

We will take it for granted that there is some truth in both theories. Undoubtedly, some people do have a greater natural capacity for leadership than others. However, this need not mean that the others are totally incapable of leadership of some kind or to some degree. On the contrary, experience indicates that the average person can increase his skill in leadership, just as by practice and application he can increase his skill as an athlete, a mechanic, or a mathematician. Leadership—like these other skills—requires the mastery of basic techniques.

Mastery of technique, however, is not the entire secret of becoming a leader. Other individual qualities determine whether a person who has learned the basic rules will become a fair, good, or outstanding leader.

Two men who have similar knowledge of football, for example, will not, for that reason, become equally good players. Nor will the bigger, faster man always prove to be the better player. Perhaps the

Because the demand for high-caliber leadership will always be greater than the supply, the competition will be increasingly keen, the rewards worth while, and the "Leaders Wanted" sign will never be taken down

smaller or slower man likes the game better, and is willing to apply himself more intensely to mastering the game.

Applied to leadership, these personal factors have an influence similar to two men who start out with the same potential gifts and understanding of leadership; one will be better equipped than the other to take full advantage of the leadership opportunities that may come his way.

"Is everyone a potential leader?" The answer appears to be almost everyone. Whether the potential leader ever becomes a leader, however, is largely up to the individual. If he does nothing to improve his leadership possibilities, he remains only a potential leader. If he makes full use of whatever natural gifts he has been endowed with, he will develop as a leader. When the opportunity for exercising leadership arises, he will be prepared to make the most of it.

The success of any group activity depends partially upon the quality of leadership that has gone into it. No group of people can work as a team unless the members of that particular team recognize someone in the group as the person responsible for organizing their work, directing their efforts, and also inspiring maximum contribution from each member.

Our political leaders are elected by the people or appointed by their representatives. Our business and industrial leaders usually have gained their positions because of proved technical knowledge and skill. Chosen or appointed leaders in all fields have one thing in common: they have accepted certain responsibilities toward the people who look upon them as leaders in a particular field of endeavor.

Perhaps no human activity is more dependent upon good leadership than that performed by the Armed Forces. No other group effort is so likely to be a *life* or *death matter*, both for the people taking part, and for the nation in whose behalf its efforts are directed.

A political leader, who fails to live up to expectation, can be voted out of office at the next election. A business leader, who falls below the standards of his calling, may lose money or go bankrupt. However, the failure of a leader in the Armed Forces can be much more serious. His failure might well result in needless casualties, and even in defeat—not only of his own command, but to much larger forces, or even to the nation.

A failure such as this, of course, would occur only when the Armed Forces were actually engaged in a war. But failures of leadership during peacetime are no less costly, and often are a direct cause of later failures during war. Leadership is not something that can be developed overnight. The Armed Forces cannot wait for war to come before taking stock of their supply of leaders. On the contrary, they must constantly stress the development of leaders as a primary objective of all peacetime training.

The Armed Forces today have a double purpose in stressing leadership training. First, they want to be sure of having sufficient leaders to fill the current peacetime assignments. Second, they seek to build a supply of potential leaders capable of assuming the additional responsibilities that fall upon the Armed Forces in times of national emergency. Insofar as the welfare of the country is concerned, these two purposes are equally important.

In one sense, the job of a leader in peacetime is more difficult than it is during war. The peacetime leader functions without the dramatic incentives that exist in wartime. When an enemy is at

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First Lieutenant James C. McCullough, USAR, entered the service in 1946 and received his commission from the Army Officers' Candidate School at Fort Riley, Kansas in 1948. After 6 years' duty with various Military Police units, he was separated from the service in January 1954 to attend Howard University in Washington, D. C.

hand, the leader does not have much difficulty in calling forth the best efforts of each member of the team. In extreme situations, men respond to their leader because of the belief that he may save their lives. Even when the situation is less critical, the existence of war tends to bind the group together and its members recognize a common interest—they respond more readily to leadership.

When war is just a possibility in the indefinite future, however, its power to bind men together is still less direct. The team's common purpose is not vividly demonstrated from day-to-day. The relationship between the duties of its members and the *ultimate* safety of their country is often hard to see clearly. The leader who can inspire the best efforts of men in peacetime, need never be uncertain about his ability to lead men in war.

A question which arises in the minds of some is, "At which level of command is leadership most important?" There is very little ground for argument on this question, for all students of military organizations are in general agreement on the answer. They emphasize that *no level of command* is more important than the other. Good leaders are essential at every level. A surplus of outstanding leaders at the topmost level would not offset a shortage of leaders in the lower echelons. Nor would the situation be any better, if the lower echelons were filled with excellent leaders, while the top commands were held by mediocre leaders. Poor leaders at any point in the chain of command disrupt the efficiency of all other links in the chain.

The Armed Forces never have had, and never will have, more good leaders than they can use. The problem of securing good leaders is always vital. Our peacetime Armed Forces could be at a full numerical strength and supplied with the best in arms and equipment, however, if they lacked leaders of required quality and numbers, they would not be ready to perform their mission.

The number of leaders needed by the Armed Forces is not a set figure, such as a certain percentage of the total number of men. Nor can the need for leaders be calculated in the same way as amounts of weapons and supplies are estimated. A simple rule-of-thumb governs the constant search for leaders. That rule is: *We can never have too many leaders.*

Everyone in the Armed Forces owes to himself, and to his country, the obligation of discovering whatever talents for leadership he may have. A frank self-examination of our abilities is an important first step toward making certain that our time is used to the best advantage. Regardless of the answers we may get, this self-examination is useful. One man may discover that his leadership talents are better than average, but that he has *not* been using them. Another will find that he has been trying to advance along lines in which his talents are weakest. Each should determine whether or not his natural gifts are of a kind that can best be used to serve his country in positions that are primarily dependent upon his ability to lead others. In order to know this, he must first know what qualities a leader *must* have, and those which he *should* have.

One convenient way to determine what qualities a leader *must* have would be to pick out some great leader of the past who possessed *all* of them. Unfortunately, no such leader has ever existed. Even the greatest have had their shortcomings.

Most of the qualities we will mention now are those that were stated by servicemen in a survey conducted during World War II. They are qualities which these men felt were essential, or desirable, in the officers and noncommissioned officers who led them.

Competence.—Most servicemen named competence as essential for a good leader. By competence, they meant technical

mastery of his own job, and knowledge of the tasks and duties of the men he leads. Without competence a leader cannot instruct and assist others, or inspire the necessary respect and confidence of his subordinates.

Honor.—Most servicemen expect their leaders to demonstrate high standards of personal honor and integrity. They expect them to live according to high standards of personal decency and morality, and to be outspoken in their belief.

Selflessness.—This is the opposite of selfishness. It includes pride and loyalty to the men he leads—a deep and sincere interest in the welfare of the individual and confidence in his ability to do what is expected of him.

Decisions.—An important part of a leader's responsibility is that of making decisions; decisions designed to accomplish desired objectives, and which affect the comfort, welfare, and even the lives of those whom he leads. Military decisions very often are extremely difficult to make for these reasons. Men have the greatest confidence in their leaders when they recognize that difficult decisions have been reached after thorough study of the alternatives, but without unnecessary delay.

Impartiality.—Men who are able to feel that their leaders are giving everyone a fair share of the breaks and of unpleasant duties will be more likely to excuse other minor shortcomings of leadership.

Military Bearing.—This is a physical quality for the most part involving the leader's personal appearance, his voice, stance, neatness of dress, and general manner. Men expect their leader to look like a leader. Genuine military bearing does not include pompousness or overzealous observance of military customs—regardless of the situation.

Judgment and Common Sense.—Men like to feel that *their* leader is capable of meeting situations with mature judgment, and proficient enough to set an example in an unusual situation which can be followed by the entire group.

Others.—Many qualities, not ordinarily regarded as related to leadership, often have proved helpful to great leaders. Some leaders of average competence may have risen to greatness because they possessed personal gifts that seem to have little to do with leadership. Friendliness, kindliness, humor, and similar traits are only a few that might be mentioned. There have been great leaders who seemed to lack all of these, but there have also been great leaders who might not have achieved greatness, except for such qualities.

The organization, weapons, and techniques of the Armed Forces are constantly changing. The basic requirements of a leader never change. Machines, tools, and weapons have value only if men know how to use them. This involves knowledge of their physical characteristics, their purpose, and the characteristics and capabilities of the persons who use them. A leader must know these things and, at the same time, he must be willing to accept responsibility for the proper use of both man and machine in accomplishing the objective. His technical competence must be backed by his ability to create a feeling of mutual respect in leader and led alike. If he can analyze any new situation, and decide promptly on the best means of coping with it, the confidence and respect of his followers will be increased. If he habitually explains his purpose, and intelligently assigns duties for its accomplishment, he will stimulate the initiative and enhance the self-respect of his subordinates.

The demand for leaders of this caliber always will be greater than the supply. This makes for keen competition and worth-while rewards. The "Leaders Wanted" sign never will be taken down. The ability to lead men will never be a surplus commodity within the Armed Forces.

MILITARY NOTES AROUND THE WORLD

UNITED STATES

Navy Orders OE-2

The Navy has ordered 25 *OE-2* airplanes, a plane similar in many ways to the Army's *L-19 Bird Dog* but with a much higher performance range, according to a recent announcement. The plane will be powered by a 260 horsepower supercharged engine coupled with a constant speed propeller. Armament installed for the protection of the crew can be easily removed to allow a greater payload when needed. The plane also differs from the *L-19* in the tail section where the *OE-2* has a higher dorsal fin and a much higher vertical fin. In order to accommodate the larger and more powerful engine, the cowling has been changed.—News release.

Navy's *OE-2* will get more powerful engine.

'Walkie-Recordall'

A new portable, battery-operated recorder, so small that it can fit into a brief case, and so sensitive that it can pick up whispers while so concealed, is now available. According to the report, the new device, called the "Walkie-Recordall," records continuously, on the spot, anywhere, and for periods of up to 4 hours. —News release.

Bayonet Tactics

A new method of bayonet fighting, in which the guard position is with the rifle held diagonally across the body—a form of high "port arms"—is being studied by Army and Marine Corps authorities. The new method provides a better guard and leaves the individual with less time out of the guard position. It yields a faster striking speed with quicker recovery and provides the first real change in bayonet fighting since 1905. This new method adds up to 10 inches to the range of the individual with his weapon, keeps him in better balance, and requires less energy. During 2-minute runs, the method required an average of 54,261 fewer foot pounds of work than the regulation method. This amounts to a saving of more than four-fifths of a horsepower in that time. —News release.

Trim Caps

The use of gold leaf trimming on the visor of caps worn with the new Army Green uniform by officers of field grade and above has been recommended by the Army Uniform Board to the Secretary of the Army. The same black visored cap as worn by enlisted men would be worn by company grade officers and warrant officers, but all officer caps will have a gold chin strap. If approved, the gold leaf trimming would have two arcs of gold leaves in groups of two, the same as now used on the dress cap. Similarly, gold leaf trimming for general officers would be used around the crown of the cap, as is the case with the dress cap worn by general officers. The feasibility of using nylon cord instead of the more expensive gold bullion is being studied, according to the report.—News release.

Solar Battery

A simple, quite efficient, and direct converter of light into electricity may be first put to work electronically in the nation's telephone system. This little solar battery is made of the common chemical element, silicon, in unusual metalic form. It gathers energy from the sun's rays to supply power to carry speech and music over telephone wires or radio transmitter. Mobile equipment, such as small radio transmitters, will be powered by the battery and sun-powered battery chargers will be used at amplifier stations along rural telephone systems of newer design. The device has 6 percent efficiency in converting sunlight directly into electricity. This figure compares favorably with steam and gasoline engine efficiency. Advantages of the solar battery include: no cost of fuel; nothing consumed or destroyed in the energy conversion process; no moving parts; and no wearing out or obsolescence which should theoretically make the battery last indefinitely.—News release.

Atomic Submarines

Department of Defense has requested funds to build two more atomic-powered submarines during the coming fiscal year. If approved, this would give the country four of this type submarine.—News release.

Combat Stress

According to a recent study, combat stress was greater among pilots and crews of reconnaissance and bomber planes than among fighter pilots during the Korean conflict. The studies, involving 111 Air Force pilots flying combat missions, indicated that accurate prediction of performance of duty was difficult as some of the pilots who were given "poor ratings" prior to their missions, turned in superior performances. It was revealed that combat stresses were intensified sometimes by "injudicious and ill-advised" letters from wives and parents who burdened the fliers with problems at home. The fear of flying was seldom observed, although anxieties over possible ditchings in enemy territory were common, especially among pilots with few combat missions. This was because they feared inhuman treatment of prisoners by the Chinese Communists. The Air-Sea Rescue and Medical Air Evacuation Services were important morale builders.—News release.

Airport Radar

Using recent developments, a new radar set promises elimination of most landing delays due to fog and bad weather. With the new system, as soon as radio contact is made with a plane, a line is drawn on the radar screen from the scope's center to that plane. The radar operator is then sure that he is talking to the same plane that he is watching on his screen. A map of the area is reproduced electronically on the radar scope, showing local hazards such as tall buildings and power lines, in relation to airplanes in that vicinity by another new development.—News release.

Communications Budget

The estimated requirements for military communications and electronics for the Fiscal Year 1955 amount to approximately 1 billion dollars. The Army's request includes the amount of $52,300,000 for local communications and photographic services at Army installations; $47,300,000 for operation of the Army Command and Administrative Communications network; and 355 million dollars for research and development, of which a large part would be devoted to the fields of electronics and communications. The Navy is expected to ask for $13,682,000 for maintenance and operation of Naval Communications and 80 million dollars for other communications and electronics programs in the Navy. The Air Force asked for $410,669,000 for communications and electronics equipment; $12,241,000 for operation of its Command Communication System; and $32,629,000 for the Air Force commercial communication system, which provides for such services as leased wires and network facilities.—News release.

Amphibian Assault Vehicle

A modern version of the old landing vehicle tracked (LVT), which the Marines used extensively in their World War II landing operations, is now under production for the Marine Corps. The modern version of the amphibian assault vehicle, called the LVTP-5, combines many qualities of the old LVT with new and improved speed, range, and maneuverability which should provide future assault forces with a mechanized capability heretofore unattainable in the initial phases of an amphibious operation, according to the announcement. The vehicle, which is manned by a crew of three, is an armored personnel and cargo carrier that can hit the beach with more than two squads of combat-ready Marines in faster time than its predecessor and provide greater versatility on land.—News release.

Shock Antidote

Recent developments have indicated that atropine, the drug that is an antidote to nerve gas, may become standard low temperature protection equipment for sailors, fliers, mountain climbers, and explorers. It was revealed that many of the sailors and fliers who floundered in the icy waters of the North Atlantic during the early days of World War II might have had a better chance for survival if atropine had been part of their survival equipment. This drug prevents the often fatal shock that comes from extreme exposure to cold by speeding circulation and destroying the chemical, acetylcholine (ACH), which cuts down circulation.—News release.

Weather Observer

New, sensitive electronic weather observation equipment, designed to help speed the landing and takeoff of aircraft, has been developed recently. The new equipment is placed close to the runway to measure cloud height and visibility, thus enabling sudden changes in ceiling or visibility to be detected immediately. This information is then transmitted automatically to the local Weather Bureau observation station and the Civil Aeronautic Administration control tower, resulting in better traffic control than is possible when information comes from more distant sources.—News release.

Recording 'Tire'

As the result of rubber experiments, a rubber "tire" for recording sound magnetically has been developed. Capable of repeating messages millions of times, the "talking rubber tire" is useful in weather announcing systems, in answering persons who dial vacant or disconnected telephone numbers, or in operating automatic answering and recording devices. Basic ingredients of this "tire" are rubber and iron oxides.—News release.

Clinical Thermometer

An electronic clinical thermometer which is much easier to read, will not break, and gives an accurate reading in 5 seconds has been developed by an Army dentist. The new thermometer, the *Swiftem*, is the first new innovation in this field since 1867. Only one-fortieth of the time normally required to take daily ward temperatures was needed when the new device was used. Degrees are registered in numerals on a meter, just as speeds are indicated on a speedometer, with the new thermometer thus making them easier to read. The new instrument is unaffected by extreme temperature changes, humidity, and pressure, and is, therefore, more accurate. Glass is subject to many kinds of structural change leading to many inaccuracies. There is also no breakage and less loss with the electronic thermometer.

The new instrument is lightweight and fits easily in the palm of the hand. In appearance and size, it resembles a photographic light meter. Its operation is controlled by a push button. The sensing device or probe, attached by a transmission cord, carries an electronic device which resists heat and translates this resistance in terms of degrees on the meter. Probes are easily detached for sterilization and are designed for oral, rectal, or skin temperatures. Because the length of the transmission cord in no way alters the efficiency of this thermometer, it will be possible for a nurse to remain at her desk and take a patient's temperature in the next room, according to the report.—News release.

Navy Rocket

The largest American-built rocket for upper-air research, the *Viking 10*, is reported to have attained a height of 136 miles and a speed of approximately 4,000 miles an hour. This Navy rocket weighs 7½ tons and is 42 feet long.—News release.

State of War

For legal purposes a state of war existed within the continental limits of the United States during the fighting in Korea, the United States Court of Military Appeals held. The court ruled against two privates who had argued that the statute of limitations barred prosecution against them for offenses alleged during the Korean conflict.—News release.

Divisional Redesignations

As a result of the return to state control of the 28th, 31st, 37th, and 43d National Guard Divisions, there has been a series of redesignations of both training and active Army divisions. The 69th Infantry Division has been activated at Fort Dix, New Jersey, as a training division to replace the 9th Infantry (Training) Division at that installation. The 9th Infantry Division designation will be given personnel of the 28th National Guard Infantry Division in Europe, with the 28th's numerical designation to be returned to control of Pennsylvania, together with its colors and honors. Similarly, personnel of the 43d National Guard Infantry Division, whose designation is to be returned to Connecticut, Rhode Island, and Vermont, will become members of the 5th Infantry Division.

The 101st Airborne Division has been activated as a training division at Fort Jackson, South Carolina, to replace the 8th Infantry Division. This division will be reorganized as a Regular Army Combat Division at Camp Carson, Colorado, with personnel and equipment of the 31st Infantry Division, a National Guard outfit whose numerical designation and colors are being returned to the states of Alabama and Mississippi. No airborne training will be conducted by the 101st Airborne Division. The change is a change in name only and will in no way affect any of the personnel who are now members of the 8th Infantry Division.—News release.

Commissaries

Tacit approval to the Department of Defense decision to keep open virtually all military commissaries in the United States and to reduce the surcharge from a previous 5 percent to 3 percent overseas and 3½ percent in this country was given by the House Appropriations Committee. During the hearings the Committee had the opportunity to question continuation of many commissaries, particularly the more controversial ones in or adjacent to large cities, but took no action nor did they question the action to reduce the surcharge to cover cost of utilities.—News release.

Household Goods

A House Appropriations Committee has recommended that military families be allowed a maximum of 11,000 pounds for shipment of household goods in any single move. Present maximum is 9,000 pounds. The Appropriations Committee raised the limit 2,000 pounds after hearing testimony by Department of Defense officials that the 9,000 pound limitation was unjust in view of the higher limitations for civilian Government employees, such as members of the Foreign Services, and was creating a hardship on military families. Congress must vote on the proposal before it becomes effective.—News release.

Recruiting System

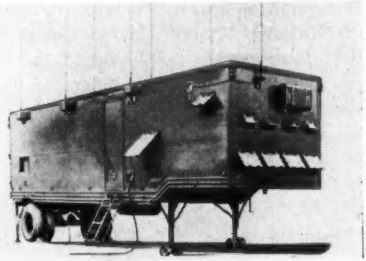
With the beginning of the new fiscal year, the Air Force has been authorized to take over its own recruiting system in an effort to combat the downward trend in enlistments in that service. Personnel officials believe that by withdrawing from the joint Army-Air Force recruiting system they can recruit more men who will remain for more than a single tour of duty. In this way they hope to save on the estimated cost of $14,000 for training each new airman, according to the recent report.—News release.

Jet Engine Brake

Practical designs for jet engine "reverse thrust" devices to enable jet transports, bombers, and fighters to operate from the majority of existing airfields have been developed. Under development for more than 3 years, the new "jet brakes" would divert the tremendous power of jet engines so as to easily, quickly, and safely slow down planes once the wheels have touched down on the runway. Previously, reverse thrust by means of propellers has been one of the few advantages enjoyed by propeller-driven planes over jets. The device consists of a "clam shell" thrust reverser which deflects forward the flow of fast moving gasses from a jet engine's tailpipe. —News release.

Operations Center

The latest equipment developed for use in establishing an Antiaircraft Operations Center (AAOC) in combat areas is Operation Center, AN/MTQ-1. It consists essentially of communication, plotting, and display equipment installed in a 30-foot, air-conditioned and heated semitrailer van and two 220-volt, 60-cycle, 3-wire, single-phase, 10 kilowatt generators. It is mobile, rugged, and air transportable. Time required for placing the equipment into operation or for march order is only ½ hour. With this equipment, an AAOC can now operate in the most fluid combat operations.—News release.



Semitrailer van used as operations center.

JAPAN

Salvage Net

Operations to salvage an antisubmarine net laid by the former Imperial Navy near Kure Naval Base have been started. The net laid in the western Seto inland sea during the Pacific war extends from Tsurumi headland in Kyushu to Yura headland, Shikoku Island.—News release.

SOUTH KOREA

New Corps

The VI Army Corps of the Republic of Korea's Army was recently activated. This new unit will give the Republic of Korea 20 divisions and 5 corps in her Army. There is no IV Corps because this number is regarded as being unlucky.—News release.

ARGENTINA

Atomic Reactors

Because of the availability of raw materials required in the undertaking, the construction of atomic reactors in Argentina will be accomplished without recourse to foreign equipment, it was reported by the National Atomic Energy Commission. Berillium, readily available in the country, will be used as the moderator in conjunction with uranium, instead of heavy water or graphite as used in other countries. It is planned to use nuclear energy to replace coal and other fuels for the production of electric power and for industrial purposes.—News release.

Rocket Experiments

Successful experiments in aerial gunnery with *A3F* rockets have been carried out by the Aerotechnical Institute in collaboration with the Military Manufacturing Command. During the tests, the rockets were launched singly, in pairs, and in volleys using an *IA24 Calquin* plane. The manufacture of the rocket met the aims of the Government to reduce to its simplest form modern theories on aerial combat according to the report.—News release.

BRAZIL

Oceanographic Ship

An oceanographic vessel with an operational radius of 4,500 miles has been purchased by the Oceanographic Institute of São Paulo. Claimed to be the first of its type in South America, the ship was built in Brazilian shipyards and in addition to normal living quarters, it has physical, chemical, and biological laboratories. It has a dead weight of 200 tons, is about 100 feet in length, and is driven by a 400 horsepower diesel motor.—News release.

Iron Mountain

More than 165 feet have been taken from the peak of Brazil's famed "pico do Caué," considered the best source of iron in the world, according to a recent announcement. The ore is extracted mechanically from the peak of the mountain, which originally stood 4,600 feet above sea level. More than 1½ million tons of ore were shipped through the port of Vitória from mines in this area last year.—News release.

Penicillin Laboratory

The largest penicillin laboratory in South America was recently opened in São Paulo. The factory was built at a cost of 8 million dollars.—News release.

Aluminum Production

The construction of additional aluminum plants to raise total production to approximately 20,000 tons yearly is planned. One plant is producing about 1,000 tons annually now and about 15,000 tons are imported.—News release.

GREECE

Reduce Army

As an economy measure, the size of Greece's 140,000-man Army will be cut by one-fourth, or 35,000 men. It was expected that some of the savings would be spent on air bases and other defense installations.—News release.

GREAT BRITAIN

Tap Atom

Preliminary work to build a big, fast reactor of the breeder type has already started at Dounreay, in Caithness, Scotland. When completed, the atomic pile will be used to power the homes and factories of Great Britain, according to the announcement. It was expected that the project might revolutionize the industry of the country. The plant will produce more fissionable material than it uses in feeding out power according to the predictions of its designers.—News release.

Night Fighter

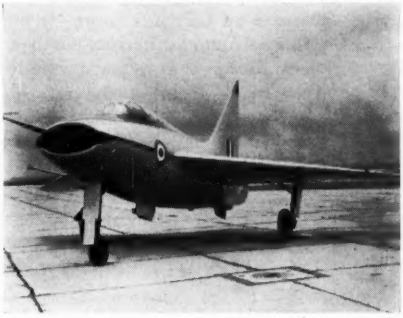
As an answer to the potential threat of the high-performance night bomber, the *Venom NF 3* has been developed. Her sister ship of the Navy, the *Sea Venom*, is very similar except for special naval equipment which has been added to the plane.

***Venom NF 3* carries latest radar equipment.**

The plane is equipped with American electronic combat aids and carries the latest radar interception equipment. It has a maximum speed of 630 miles an hour and when equipped with drop tanks, has a range of more than 1,000 miles at an altitude of 30,000 feet. The plane's armament consists of four 20-mm cannon. This is a 2-seat version of the night fighter.—News release.

Aerodynamic Research Plane

A plane designed for aerodynamic research at or near the speed of sound, the Boulton Paul *P.111A*, is powered by a *Nene* turbojet engine. The plane differs

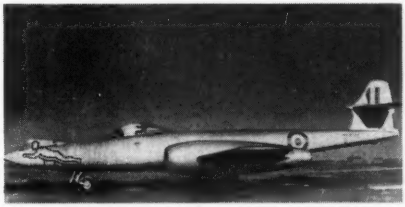


Aerodynamic research plane finishes tests.

from earlier models of the same line in that it is equipped with air brakes, which consist of four rectangular sections spaced at equal intervals around the fuselage, and has a long string projecting from its nose to carry a pressure head.—News release.

Prone Cockpit Plane

The latest plane to use the experimental prone pilot position in the nose is the *Meteor*. The pilot lies on his stomach with his body, head, and elbows supported by



Prone pilot cockpit is tested on *Meteor*.

shock absorbing cushions. In the *Meteor*, the plane has been equipped with a special nose and the normal seat is retained. Trials with prone pilots have been going on for some time.—News release.

USSR

Insular Bases

The Soviet Union is constructing two insular air bases, one on the East German island of Rügen in the Baltic and the other on one of the Novaya Zemlya Islands in the Arctic, according to latest reports. The base on Rügen is becoming one of the strongest points in the chain of Soviet bases along the western rim of her empire. In addition to the existing launching sites for guided missiles, jet fighter and bomber fields, and extensive radar installations, the island is now getting a base for large military seaplanes. At the Arctic base, the Soviets are reported to have made good progress on an airfield with runways approximately 8,500 feet long.—News release.

Atomic Bomber

A new Soviet bomber, the *Ilyushin-38*, is said to be capable of delivering atomic air attacks on the United States. In size, the new plane is reported to be between that of the *B-47* and *B-52* of the United States. It is a swept-wing bomber powered by four turboprop engines. Another long-rang bomber capable of carrying atom bombs to most American cities from bases in the Arctic is the *TUG-75*. This 4-engine turboprop plane is reported to have a range of 7,650 miles with a top speed of 415 miles an hour.—News release.

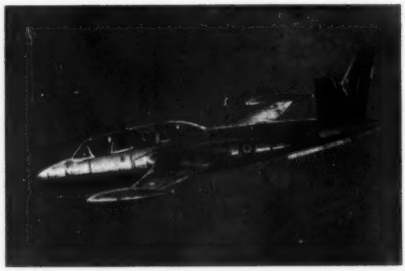
Plane Production

During recent years the Soviet aircraft engine industry has developed to the point where it is now able to improve the power plant designs which it copies. According to recent reports, technical advances in this particular field may indicate the possibility of future Soviet engineering developments without having to resort to foreign brains. It is also reported that the Soviet Union has 20 factories presently manufacturing turbojet/turboprop power plants.—News release.

FRANCE

Jet Fighter Trainer

The *170 R Magister* is a light, 2-seat jet fighter-trainer which has amazing acrobatic qualities and is equipped for blind and night flying. Its armament consists of two machine guns and gyro sights, cine gun, two rocket launchers, and two racks for 110-pound bombs. The plane is of all metal construction and is powered by two *Turbomeca Marbore II* turbojet engines,



***Magister* has amazing acrobatic qualities.**

capable of developing a total of 1,672 pounds thrust. It has a "butterfly" type tail unit of two interchangeable elements with an angle of 110 degrees between them. The *Magister* also has a fuel feed system for up-side-down flying, it has been announced.—News release.

Economic Expansion

Under the 18-month plan recently adopted by the French Council of Ministers, definite goals have been established. It is planned to increase the index of industrial production from 150 to 165; to affect a 10 percent rise in the gross national product; to raise the workers' purchasing power by 10 percent, by increasing wages, expanding employment facilities or lowering prices; and to free trade with foreign countries as much as possible, in accordance with the recommendations to be made by the committee of experts now studying the disparity between French and foreign prices.—News release.

SWEDEN

Weather Forecasts

During maneuvers for Swedish military forces this summer, a giant electronic brain will make weather forecasts for 48 hours in advance according to the Director of the Institute of Meteorology in Stockholm. The Swedish computer, Binary Electronic Sequence Computer (BESC), which is capable of making approximately 2,700,000 calculations in less than half an hour to yield the figures on which the 24-hour forecast is based, is the device which will be used. To obtain numerical weather forecasting, information on current weather conditions is fed into the computer and using prescribed formulas, the "brain" computes the winds for one level in the atmosphere 1 hour in the "future." Then, working in 1-hour jumps, these forecasts are repeated until, finally, a picture is obtained of the winds 24 or 48 hours from the time the original data were inserted. The gathering, plotting, analyzing, and feeding the information into the machine for a 24-hour forecast requires about 10½ hours although the machine does its computations in about ½ hour. It is expected that with the aid of the computer, forecasts for 5 days and even longer periods will be possible.—News release.

TURKEY

Port Construction

Work has begun on the construction and modernization of the port of Samsun on Turkey's Black Sea coastline. The work is estimated to cost 25 million dollars and new installations will include two breakwaters, measuring 5,082 and 9,837 feet long. Loading and unloading facilities will be capable of handling 350,000 tons of commercial cargo, 450,000 tons of cereals, and 200,000 tons of coal. Similar improvements will be made at the port of Mersin on Turkey's Mediterranean shoreline.—News release.

DENMARK

Allied Troops Out

Any chance that allied air forces would be based in Denmark in peacetime was ruled out by the Foreign Minister. He indicated that despite the risks his country is facing, public opinion would turn against the Atlantic Alliance if allied troops were brought there at this time.—News release.

NORWAY

Winter Maneuvers

The biggest winter maneuvers ever held in Norway, involving more than 25,000 officers and men, have been conducted in the Ostfold area, southeast of Oslo. The exercise, *Winter II*, was primarily designed to gain more experience in combined operations between Army, Air Force, Artillery, and National Guard. Heavy snow fell during the exercise and hampered military transportation. A new type of emergency ration, the first to be made in Norway, was tested. It weighs but 225 grams and contains 1,060 calories, enough for 1 day's needs. A patented military bath-on-wheels, featuring separate dressing room and shower, accommodating 10 at a time, was also on trial. It may be expanded or contracted, as required. Spring water for the high pressure tank feeding the shower is supplied by an outside pumping engine.—News release.

EAST GERMANY

Increase Forces

By the end of this year the Communist East German regimé expects to build up its police force to 690,000 regulars and reserves. Units of the so-called "barracks police" and border police, both militarily trained and equipped with Soviet weapons, are to be increased from their present strength of 156,000 men to 190,000. The remainder of the inflated forces will be a police-trained "military reserve."—News release.

SOUTH AFRICA

Defense Structure

The country's defense structure is taking definite shape and South Africa has engaged in defense conferences with Great Britain and the United States concerning the defense of the gateway to Africa, according to the Minister of Defense. He said that a modern army division required 14 combat units and that the country now had 44 such units—enough for three divisions. South Africa has 12 armored units while only three are needed for a division. He also reported that one-third of the several hundred tanks on order had already arrived in the country. In her Air Force, South Africa has 2,700 trained officers and men in her regular force and more than 1,600 in the active reserve. The country now has three coastal reconnaissance squadrons in the regular force and one in the active reserve. In addition, there are nine fully-equipped bomber squadrons. There are five radar training schools and radar equipment is now being manufactured in South Africa. The country's young Navy has also taken part in combined exercises with the navies of Great Britain and France. —News release.

Oil From Coal

Gasoline from Sasol, the oil-from-coal plant, is expected to be available to the public by the end of this year. When the factory is in full production, it is expected to yield 55 million gallons annually. The octane rating of this gasoline will not be lower than that being sold at the present time.—News release.

Communications Link

The first direct radio-telephone link between South Africa and Argentina was recently opened with the terminals located in Cape Town and Buenos Aires. Calls from South Africa to Argentina cost about $2.80 a minute with a minimum charge for 3 minutes.—News release.

CHILE

Expand Air Arm

In developing her expanding air arm, the Chilean Government has purchased *T-34 Mentor* military training aircraft and *D18S* military trainer transports from the United States. The Air Force has recently purchased 25 of the *T-34s* and they were flown to South America by Chilean pilots. The Navy and Air Force have both purchased the *D18S* which has been developed for use as a tactical support airplane and armament trainer. The plane carries two .50-caliber machine guns in the nose, and has provisions under the wings for either twelve 2.25-inch rockets or two 100-pound bombs. The Navy will use the planes in a general utility purpose for the fleet along the 4,500-mile coastline of the country. Naval aviation has only recently been established in Chile. The *D18S* can be used as a twin-engine trainer, navigation trainer, transport, photo reconnaissance, or ambulance airplane.—News release.

CANADA

Pilot Training

A workable civilian-to-military training program has been instituted by Canadian flying clubs. Courses leading to private lessons cost approximately $350. Upon completion of the course, both the student and the school each receive $100 in Government reimbursements. If the trainee enlists in the military service, he gets an additional $200.—News release.

AUSTRALIA

Uranium Fields

Three additional uranium fields in the Northern Territory, all within 120 miles of Darwin and close to the Stuart Highway, linking Darwin and Alice Springs, have been discovered recently. The finds are the result of an intensive search by the Government and private prospecting parties who have been working in spite of the start of the wet season.—News release.

FOREIGN MILITARY DIGESTS

Reconnaissance

Translated and digested by the MILITARY REVIEW from an article by Colonel K. Spilhaug in "Militaer Orientering" (Norway) 25 June 1953.

DURING the course of field exercises after the war in Germany and in Norway, it was constantly evident that the reconnaissance service did not function as it should. The possibilities for obtaining information concerning the enemy had by no means been fully exploited, either by staffs or the reconnaissance services themselves. Much was also lacking in the manner in which the reconnaissance services conducted their operations.

All are agreed that in the planning and execution of an operation, it is of vital importance that the most complete and accurate information possible concerning the enemy be available. This is the first requirement which must be met if one is to correctly and economically dispose one's forces.

In peacetime exercises, time is usually too limited for precise, systematic reconnaissance. This is certainly one of the main reasons why reconnaissance is not conducted as it should be. Since it is difficult to practice in war what one has not been taught in peacetime, I feel that it is important to discuss the reconnaissance service which is the purpose of this article.

Reconnaissance is the obtaining of information concerning the enemy and the terrain, and the transmission of this information, as quickly as possible, to the next higher commander.

Reconnaissance is usually considered as:

1. Long-range reconnaissance, which is conducted by aviation, agents, or other similar means.

2. Medium reconnaissance—up to distances of around 60 miles in advance of one's own forces—which is obtained by specially trained and equipped reconnaissance detachments.

3. Close (combat) reconnaissance, which is conducted by troops on the front line.

In this article, only the most usual form of reconnaissance is dealt with and not the technical reconnaissance of roads, bridges, railway lines, and billeting, which is usually conducted out of range of the enemy's fire and observation.

No definite limits can be set as to how far the different forms of reconnaissance

extend. This is dependent upon the terrain, the size of the unit involved, the enemy's behavior, and the tactical situation, among other things.

Information concerning the enemy and the terrain may be gathered by agents, aviation, one's own civilian population, patrols, and individual soldiers. Thus, we see that information may be gathered in numerous ways and both from the air and from the ground.

In this article, we shall deal only with medium and short-range reconnaissance. The principles of reconnaissance are always the same.

It is only the means that vary. Reconnaissance must always be conducted with all the means available, whether the unit is at a halt, engaged in an advance, an attack, or in defense.

It should be understood, however, that:

1. An order for a pause in the advance does not apply to reconnaissance.

2. Contact, once established, must be maintained with all means.

3. An order for a pause in the advance does not apply to the effort to maintain contact.

The fact must be borne in mind that the best information is obtained when in direct contact with the enemy. Good reconnaissance requires clarity and understanding in the assigned mission, and foregoing specialization in reconnaissance on the part of the personnel conducting it. It also requires speed, alertness, and dependability on the part of the message service.

The following information concerning the enemy is especially desired: What units has he; what is his strength? Where is he; what is his disposition? How is he organized and equipped? What are his movements; what is he attempting to do? What is his armament and his supply situation? What is his condition and morale?

Concerning the terrain, one usually desires to know: its traversability; types and conditions of routes; other communications; obstacles: rivers, minor streams, loose soil, hills or mountains, and forests; possibilities of observation and fields of fire. Elevations (hills, ridges) are useful for observation and should be seized before the enemy obtains a hold on them.

Training

During war it is infinitely more difficult to obtain information concerning the enemy than it is in peacetime. Modern weapons and modern camouflage techniques have made reconnaissance difficult and dangerous. It is much more dangerous to approach the enemy today than it was formerly. It does no good, as in former times, to select someone haphazardly out of a unit and dispatch him on a difficult reconnaissance mission. He must previously have had special training. Reconnaissance activity must be given a larger place in our training programs.

Reconnaissance on the ground is usually conducted by patrols.

Both the individual soldier and the reconnaissance detachment—as a unit—must receive special reconnaissance training which involves:

1. Realistic practice in all the situations that will arise in the field.

2. Proficiency in map reading and orientation.

3. The ability to observe and draw correct conclusions from what one sees.

4. A fast and reliable message service.

5. Well-trained senses—especially of sight and hearing.

Good reconnaissance training is based on detail and realistic presentation. In this connection, I mention the training in the reconnaissance service which our 2d Mountain Company underwent in Scotland during the war. At the conclusion of the detailed training course, a "patrol week" was arranged. The Company was divided into two parties which patrolled opposite

one another day and night. Hypothetical conditions were assumed and conditions were created which made the reconnaissance activity very instructive and interesting. The entire Company lived and breathed reconnaissance for the entire week. The exercises were the best I have seen in this field.

Reconnaissance in the dark must be given special attention during training. Very frequently, reconnaissance can be conducted only at night—for example, reconnaissance for an attack on a prepared position. It often happens that an attack is launched without sufficient prior reconnaissance. Such an attack would end, almost certainly, in disaster for the attacker.

Before an attack is begun on a prepared position, the position must be subjected to detailed study.

It must be ascertained what heavy weapons it possesses and where its strong and weak spots are located. Usually, it will be possible to conduct this reconnaissance at night.

Reconnaissance *versus* Security

It is an old saying that reconnaissance is the best security, and this fact has not changed reconnaissance and security overlap.

A patrol must never be assigned a reconnaissance and a security mission simultaneously. It will lead to misunderstandings and with its attention divided, the effectiveness of the patrol will be lessened. A reconnaissance patrol must be flexible in its dispositions in order to obtain information. A security patrol, on the other hand, will be closely bound to the enemy's maneuver to discharge its mission.

A reconnaissance patrol must be able to take the security measures necessary for its own protection, and a security patrol must be able to conduct whatever reconnaissance it finds necessary for the security mission it has been assigned. In both cases, all information gained concerning the enemy must be transmitted to higher authority.

Static Reconnaissance

When a pause occurs in the fighting, one must employ all one's means to ascertain what the enemy's next move is going to be. Information concerning the enemy may be obtained either by means of patrols or stationary observation posts. During peacetime exercises, there is very seldom time for any extended observation activity. When the enemy is regrouping his forces, is assembling for an attack, or is waiting for reinforcements, a halt in the fighting may occur and it is important at such times to know what the enemy is doing.

It is an old saying that the side which controls a line of hills, controls the battle. The objective of static reconnaissance is—from one or more commanding observation posts—to observe and listen to the terrain to the front, systematically, in order to obtain information concerning the enemy's intentions. To profit most from such observation, it must be conducted systematically and with a definite plan. Several observation posts along a line of hills, along a water course, or the margin of a woods, will form an observation line. When an observation post is to be located, one must first study the map carefully and afterward conduct minute reconnaissance on the ground.

In order to be able to see as much as possible, the observation post must be located far forward—often in one's own sentry line.

Since observation posts, as a rule, are located on a commanding point rising above the surrounding terrain, they will usually be exposed to attack from the air and ground.

An observation post should provide good visibility of the enemy without being exposed to enemy view, hence, it should be

well camouflaged and well defended. It is of particular importance that the observation posts be well hidden for if discovered, they will be subjected to artillery and air attacks and rendered useless. Alternate observation posts must be provided, however, for use in the event the observation posts are discovered.

Any movement in an observation post may be detected by the enemy. All glistening objects must be removed.

Remember that the enemy also has his observation posts which have us under constant and systematic observation. Traffic to and from observation posts must be unobserved by the enemy. An observation post must, therefore, be established and occupied during the night. Consequently, the detachment which is to occupy an observation post must be exempted from other sentry duty.

The service in an observation post must continue without any interruption day and night just as long as the post is in operation. It is to be occupied by two men: the one observing, the other recording what is seen or heard. An observation post must have a definitely assigned field of observation. This field should be subdivided to assist in a systematic method of observing.

All that is seen or heard in the area is recorded on standard forms. These forms will have definite spaces for date, time of day, object seen or heard, place seen or heard, and the behavior of object, if observed.

If the work of an observation post is to be effective, it must be the responsibility of a single unit. This unit should be divided into the three following groups:

1. Observation group, which will occupy the observation post itself. This must be composed of the best of the forces since the work within the observation post is difficult and fatiguing and requires particular accuracy and vigilance. This group must be large enough to permit relief every 2 hours for a considerable period of time.

2. The mission of the defense group is to maintain a watch and to defend the observation post. The strength of this group depends on the local conditions since one must always take into consideration the fact that an observation post is a favorite objective for the enemy to attack.

3. The mission of the rear group is to bring up and prepare food, handle liaison and orderly duties, and to keep vehicles and other troop equipment in repair. In short, this group will handle all tasks required behind the observation post.

An observation post is equipped with: a field telescope, map, compass (for determining angles), a clock, a sketch of the area with reference points, a log-book —prepared with places for the entries— lead pencils and erasers, report book, personal weapons, and some means for signal communication.

Communications between the observation post and the unit commander should be by telephone. Communication to the rear to the company or squadron is usually by radio. It is only the most important reports, those which are urgent, that are sent by telephone and radio. Other reports are sent by orderlies, with a certain interval being maintained between them. The commander of the unit which is operating the observation post, gives the detailed instructions for the messenger service.

Experienced intelligence personnel will be able to obtain a good picture of the enemy's activity and plans by piecing together the bits of information coming from several observation posts. This construction of a mosaic requires long practice, imagination, and patience.

Reconnaissance Detachments

Reconnaissance detachments are detachments which have been specially trained for gathering information concerning the enemy and the terrain. Because the recon-

naissance detachment must cover large fronts, they must be very mobile and equipped with good means of communication. For the same reason, they must be independent in the matter of supplies, so they can shift for themselves for several days without contact with the supply organizations.

In medium reconnaissance, tanks, armored cars, all-terrain vehicles, bicycles, and skis are used as means of locomotion. Communication means are normally by radio, telephone, runners, and signaling. A detachment is of no use for reconnaissance merely by virtue of being equipped for the task; it must, in addition, have had special training for the service. Reconnaissance detachments are to avoid combat, however, they must possess a certain combat capacity in order, if necessary, to compel the enemy to divulge information.

There are two types of reconnaissance missions for these detachments:

1. Reconnaissance over the entire front. This is the usual type employed during an advance—before one makes contact with the enemy.

2. Reconnaissance of a specific area, sector, or objective—such as forest areas, defiles, bridges, or inhabited places.

If there are several reconnaissance detachments in the same area, there must be liaison between them for the purpose of co-operation and the exchange of information. As the distance to the enemy decreases, the troops in the front line take over the mission of close reconnaissance and the reconnaissance detachments transfer their activity to the enemy's flanks and rear.

Proper and effectual training is necessary in reconnaissance activity. A reconnaissance soldier is a specialist in his field. The basis of the detachment's training was discussed previously. All training must stimulate alertness, imagination, and the spirit of enterprise, and must simulate the actual conditions of war as closely as possible.

Since we cannot take up the question of the innumerable details that must be learned by a reconnaissance soldier here, we shall mention only a few of the most important points:

1. Since reconnaissance detachments, as a rule, operate in groups, it is certainly important for group training to be thorough.

2. Because of the large distances involved and the importance of rapid and dependable communications, great attention must be given to radio training.

3. As a rule, reconnaissance detachments are the first to come in contact with the enemy's mine fields, hence it is of the greatest importance for all personnel in these detachments to be trained to deal with mines.

4. All personnel in these detachments must be expert in orientation and map reading.

5. Reconnaissance personnel must be taught to be rational, accurate, and honest in reporting facts—exaggerations and guessing cannot be tolerated.

6. The officers of a reconnaissance detachment must learn to project their thinking beyond that of the detachment.

7. When each man has been trained for his job, then he must be further trained to replace others in the detachment.

8. Reconnaissance detachments must be able to operate on foot at any time.

Use of Detachments

Reconnaissance detachments are very mobile and usually possess considerable fire power.

Commanders are often tempted, therefore, to use these detachments for other duties in an emergency.

Because of the special training which they possess and their costly equipment, these detachments are hard to replace and

must not, therefore, be unnecessarily exposed to losses.

The rule must be that missions which can be performed just as well by others, must not be assigned to these detachments. They must be given time for maintenance tasks and preparations, in order that they may be in condition for prompt assignment when missions occur.

Orders to a reconnaissance detachment are given either orally or as a part of an operation order. The mission must be as clear and simple as possible.

The order should contain:

1. Orientation concerning the enemy and one's own forces.
2. The commander's plan.
3. The mission—information wanted.
4. Sector, area, axis of movement.
5. How, when, and where reports are to be sent.
6. Time for passing the line of departure.
7. Conduct after the mission has been accomplished.

A reconnaissance detachment passes the line of departure ahead of the other troops.

It is, therefore, important that they receive their order as early as possible. Warning orders must be used as often as there is opportunity for them. In this way, the mission can be planned and prepared in the best possible manner.

Whenever the detachment is not engaged, the commander must spend his time with the staff he is working under, in order that he may be as well informed as possible concerning the situation and act as a consultant in matters pertaining to reconnaissance.

At night, reconnaissance must be conducted on foot. Mechanized detachments must be moved back with the arrival of darkness, for in the darkness reconnaissance forces will have no use for their special equipment and will merely expose costly vehicles to destruction. Reconnaissance detachments must often be assigned engineer personnel when their mission shows a need for them.

When troops effect a major withdrawal and contact is broken with the enemy, the reconnaissance detachments will maintain this contact in order to learn the enemy's intentions.

Even though reconnaissance is their principal mission, reconnaissance detachments may be used for other purposes in certain cases for: taking and holding an important area for a certain time (defile, bridge, or road junction); forming a part of the advanced guard; flank security; pursuit; and delaying action.

The Message Service

World War II gave tragic proof of how false and exaggerated reports and rumors can lead to chaos. The commander of the detachment which gathers information is responsible for getting this as quickly as possible to the proper commander—and, if necessary, to lower and co-ordinate detachments.

A report must be explicit, accurate, and brief. This is best achieved by following the formula: tell what, where, when, and how.

If a report goes out too late, it is worthless. Liaison is, therefore, of enormous importance.

Staff Work

Always report initial contact with the enemy. Negative reports may be just as valuable as positive ones and contribute, especially, to the economical use of one's own forces. Report, even if the information seems unimportant. It may possess significance in the over-all picture of the enemy that the intelligence personnel is attempting to gain.

The results which are obtained in reconnaissance depend, to a large extent, on the work which is done by the staff

which is directing reconnaissance detachments. Such a staff should remember:

1. The reconnaissance plan should cover the entire area.

2. The reconnaissance must be regulated so that the reconnaissance detachments will not encounter one another while on patrol and possibly lead to chaos.

3. Give the reconnaissance detachments simple and limited missions.

4. Do not mix reconnaissance and security.

5. In reconnaissance the most important work of the staff is the evaluation and analysis of the reports which come in. This work requires long practice, tactical judgment, and imagination. This mosaic work of evaluating and comparing the bits of information which come in requires time.

It is, therefore, very important for the commander to give the intelligence personnel the necessary time and means for their work.

The Air Force in Poland

Translated and digested by the MILITARY REVIEW from an article in "Bellona" (Polish language military quarterly published in England) October-December 1953.

THE great growth of Soviet air power during the last five-year plan period, was not without its repercussions in the satellite countries of the Soviet Union. The military aviation of Poland, an independent part of the Polish armed forces called the Air Force, underwent great change and is now on the way to becoming an important factor in the Soviet air power in Europe. The introduction of modern aircraft in Marshal Konstantin Rokossovski's armed forces, emphasized the development of this Air Force and pointed out the possibility of the formation of large air units modeled after the Soviet pattern of air divisions.

Air corps, independent divisions, and schools, are directly under the orders of the Air Force Command, and there do not appear to be any intermediate commands linking the numerous schools. The air corps are "uniform," that is, they are made up of two or three divisions of a single type of aircraft. The division is composed of three regiments, and the regiments of three squadrons. The regiment is the tactical and training unit. As a rule, it has its own air base, but in Poland, an entire division is frequently at one air base. Administrative and supply matters are performed by air base service battalions. The air base service battalions comprise the quartermaster service with all its categories of supplies, technical supervision, air base security, transportation, air base communications, medical, and meteorological services.

The regiment is composed of three squadrons of 10 planes each, as well as three planes at the disposal of the regimental command. The regimental reserve consists of nine planes. The regiment possesses, therefore, 33 operational planes and, with the reserve planes, a total of 42. Comparing this with the British organization, we see that the regiment is the counterpart of the "wing" of the Royal Air Force.

The air division possesses, therefore, 99 planes and, with the reserve, a total of 126.

Types of Aviation

The Air Force has the following types of aviation: fighter aviation for the protection of the home territory (official designation: Antiaircraft Defense Fighter

Aviation), ground attack, bombing, and naval aviation. In addition to this, there are so-called special units comprising transport, liaison, and photographic planes. There is a complete lack of heavy bombing aviation. The aviation designated as "naval" is not naval in actual fact, for it neither comprises planes with pontons, amphibian, ship- nor carrier-based planes. The units of naval aviation, in Poland, are made up of fighter, ground attack, and light bombing planes.

Fighter Aviation

The fact that this type of aviation exists in very considerable quantities could indicate that a doctrine of aviation employment consistent with the political and economic situation of Poland has been adopted.

It appears much more likely, however, that it is only a phenomenon springing from the Soviet doctrine of national defense in which, the Soviets, as the Germans in 1940-44, wish to defend themselves from air attacks by the concentration of fighter forces around the periphery of their state and, as far as possible, from the frontier proper. The location of the fighter divisions in Poland substantiates this idea.

There are eight or nine fighter divisions outside of the division which defends Warsaw and the division which defends Lodz. All of the remaining divisions are stationed in a great arc along the western frontier and on the Baltic. The presence of three Soviet divisions can be motivated by need for augmentation of the defense, but, as a matter of fact, they are there solely for political purposes.

The re-equipping of the Air Force with new material began in 1952. At the present time, the fighter aviation is being given uniform planes, namely, the *MiG-15* type, or the altered version of the *MiG-15* type, or *MiG-19*.

The three ground-attack regiments existing at the time of the war were increased to three divisions. It may be that additional regiments are now being formed.

The present designation of the units is ground-attack-bomber. It is probable that the difference between ground-attack and bomber units will soon disappear, as they are both being given the same type of planes, namely, the *Il-28* two-engine jet bomber. For the time being, the ground-attack-bomber regiments are equipped with the old type *Yak-28* and *Il-10s*. As is known, the Soviet aviation is the only one in the world, thus far, which has possessed ground-attack aviation, but the change in name points to a discontinuance of this type of aviation in its true form, for it has been rendered obsolete and will disappear under the conditions of modern warfare in the air.

Bombing Aviation

Until 1950, there was only one bomber regiment in Poznan. Today, there is a bomber division there composed of three regiments. Until recently, the basic bombing plane was the old two-engine, Soviet *Tu-2*, with a maximum speed of around 250 miles an hour. In addition to this, there are still planes of the *Po-2* and *Pe-2* types.

At the beginning of 1953, however, the regiments began to receive *Il-28* bombers, a plane which, in its flying capabilities, is close to the newest British and American planes.

Naval Aviation

We have already called attention to the illusory designation of this aviation. It may be that it is intended for co-operation with the fleet in the Baltic and used mainly for reconnaissance. Thus far, however, it comprises neither naval planes nor the typical weapons of naval aviation.

There appear to be three regiments of

naval aviation which may be combined into a naval division. The aircraft of the regiments, until recently, was mixed—different Soviet types from the last war, mainly *Yaks*—however, at present it appears also to have some *MiGs*.

Military Strength

Theoretically, the military strength of the Air Force is large. If we admit the existence of only eight divisions of fighters, three of ground-attack aviation of three full regiments, we will have altogether, 13 divisions, or 39 regiments, or 117 squadrons—or, around 1,200 operational planes. Assuming the existence of 24 large ground units in Poland, there would be an average of close to 50 planes for each large unit.

In fact, however, the military strength is considerably less. The actual strength of the air divisions is considerably less than full strength. First, all the air regiments are in the process of being equipped with new planes and have but 30 to 40 percent of their full complement of planes. There is a great shortage of pilots and crews in the squadrons—there are not enough to man a full complement of planes. This lack of personnel is understandable if we consider the fact that the development of the Air Force was begun suddenly in 1951.

The Soviets are doing everything possible to maintain a firm hold on the Polish Air Force. All command and control posts are in the hands of Soviet officers. The Commander of the Air Force is now the Soviet General I. Turkel. The entire staff of the Commander of the Air Force is composed of Soviet officers in Polish uniforms, with the exception of a few Poles who have been schooled in the Soviet Union who, nevertheless, occupy subordinate posts. All the command and staff officers of the divisions are Soviet officers. This is true of the regiments, however, in the squadrons the flying personnel is mainly Polish. The squadrons are commanded by Soviet and Polish officers. The Polish officers are very young and often have at their side a Soviet "protector." Political leaders, agents, and agitators, keep a finger on the pulse of the squadrons and regiments.

One condition that must be met if an air force is to expand, is that it must have adequate personnel, particularly flying personnel, at its disposal. To meet this condition, the number of students in the schools was increased in 1951, existing schools were expanded, and new ones were established. There are two officers' schools for the training of the flying personnel. The rule followed is that all flying personnel must be officers.

The course at the officers' schools lasts 2 years. At the conclusion of the courses, the new second lieutenants leave the schools at intervals of a few days or weeks, as they complete their examinations. In order to speed up the training, and undoubtedly also in order to maintain a constant watch over the students, there are no long leaves of absence during the course. This is compensated for, to a certain extent, by a few days of local leave of absence and free days once a month.

The entrance examinations to the officers' schools are very severe and deal largely with the past history of the candidate's family and "political face" and with the candidate himself in the matter of his civilian schooling.

As a rule, the candidates have already taken a glider, or model-building course and usually have been members of the "Aviation League." Political training also appears to occupy an important place in the schools.

There is a chain of schools for the different specialists of ground personnel and one school for technical officers, likewise of 2 years' duration.

The suddenness with which the expansion of the Air Force was undertaken

is also attested to by the large number of students at Deblin. In 1950, in three courses, they totaled 300. In 1952, however, their number exceeded 1,200. Since the new quarters had not yet been finished, one of the classes lived in tents. On the average, the capacity of the aviation schools has been increased threefold. As a result, this may permit bringing the air units up to full strength by 1955-56.

Pilot Training

The new method of pilot training is worthy of notice. In contrast with the method universally employed, in which all candidates for pilot training make use of the same type of plane during preliminary training, this method divided the candidates immediately into single-engine (fighter plane) pilot groups and two-engine (bomber and ground-attack plane) groups. The fighter pilots begin training in single-seat planes of clean-cut silhouette, while the other students have, as their first type, a biplane, which is slower in flight and in landing. In both groups, the succeeding type of plane is one already existing in military units: the fighter pilots train next in jet planes and the bomber and ground-attack pilots go immediately to units. This method probably shortens the training time. The number of flying hours in school averages about 80.

Air-Surveillance Network

The effectiveness of the fighter aviation in the protection of the home territory is dependent on the radar network and on good radio communications. We have little information concerning the surveillance network.

We may judge that it is only in its infancy, however, since the scattered radar stations cannot yet be regarded as a network. The establishment of a radar network and control centers is a long and costly matter and requires a large number of specialists. Since the Soviets are relatively far behind the Western nations in this domain, it seems doubtful that such a network could soon come into being in Poland.

In regard to a radio network, great progress appears to have been made in this field. All the major occupied air bases have their own radio stations which are in regular use, both for the orientation of planes in the air and for guiding them to the air bases.

Air Bases

The network of air bases in Poland is very dense, chiefly as a result of the work done in this field by the Germans at the time of the war. During the last 3 years, however, the Soviets have likewise given great attention to this work and the air bases have been worked over and modernized and a new chain is being constructed.

At a large number of the air bases, there are heavy runways and circular platforms. The length of the runways varies between 5,900 and 7,380 feet. In addition to military hangars for planes on the edges of the air bases, there are often large new hangars with a capacity of up to 30 *MiGs*—or an entire regiment.

It is evident that the dense network of air bases is necessary to the Soviets in case of war for maneuvers by their aviation, therefore, in addition to the air bases occupied by the Polish aviation, there is also a large number of air bases under the supervision of the Soviets, especially in the west.

Aviation Industry

The Air Force obtains all its material from the Soviets. Up to the time of the arrival of Marshal Rokossovski, there were manufactured in Poland only gliders, sport and training planes, and 115 horsepower engines for these trainers. During the years 1950-53, the development of the aviation industry began. It is, however,

an incomplete industry from the point of view of military planes.

Nothing that is manufactured in Poland in the field of aviation material is in condition for use and is shipped to the Soviet Union. Poland is entirely dependent on the Soviet Union in the field of aviation material as well as for all other things.

The small aviation industry which, however, is developing fairly rapidly, operates according to the Soviet plan and for the needs of the Soviet Union. The Polish aviation industry is not able to construct complete military planes ready for flight and combat, and such things reveal the lack of Soviet trust in her satellites.

A Soviet Soldier

Digested by the MILITARY REVIEW from an article by Colonel J. V. Davidson-Houston in "The Royal Engineers Journal" (Great Britain) March 1954.

IVAN Pavlovitch Krylov was born in 1932 in a small village near Kharkov. From the age of 6, he had attended the village school and learned to read, write, and praise Stalin. On leaving school, he had gone to work in the fields with the other members of the local collective farm.

Ivan first registered at his local recruiting center in 1950 at the age of 18. He knew that under the universal conscription law all Soviet male citizens were required to serve for 2 years. He also knew that, although called up in the summer or autumn, his service would only count from January of the following year; that he would then be required to serve a full 2 years before becoming eligible for demobilization, and that this would probably not take place until the autumn following that. Ivan, therefore, prepared himself for at least 3 years with the forces. During that winter, he was instructed to do his 110 hours of premilitary training. This was carried out in the nearby town's "club" under the auspices of the Voluntary Society for Co-operation with the Army, Air Force and Fleet (DOSAAF), and as this was some distance from his village, he was billeted in a nearby house. The training was carried out in civilian clothes and included basic drill, weapons training, and marching. It was with no great surprise, therefore, when on 15 July 1951, a letter arrived instructing him to report to the recruiting center a week later. Here he found a number of other youths from the surrounding districts. They were given a detailed medical examination and sent off by train to a large camp about 100 miles away.

On arrival, the recruits were given a shower bath, inoculated (with some protest), and had their hair close-cropped, as it would remain until their third year of service. They were issued uniforms: first, a *gymnastyorka* or long loose-fitting blouse of traditional Soviet pattern with a stand-up collar, which was worn outside the breeches and pulled together at the waist by a leather belt with a large metal buckle incorporating the Red Star; next, khaki-colored breeches, a pair of jackboots, and a greatcoat, which was rolled up and slung around the shoulders; finally, a side-hat and some foot-bindings which wound around the foot in lieu of socks.

Ivan spent his first 10 days in the camp in quarantine with the rest of his draft. When this quarantine period was completed, Ivan began his elementary train-

ing and from early morning to late at night he learned how to march, drill, and use his rifle.

After 10 weeks of this training, the day came for the recruits to "take the oath." The entire company was paraded and the colonel appeared.

"Hail comrades," he shouted.

"We wish you health," chanted the recruits.

"I compliment the company on its bearing."

"Hurrah!" roared the company.

"Thank you, comrades," replied the colonel.

"We serve the Soviet Union," shouted the recruits in parrot fashion.

This ceremony is laid down in detail in Soviet Army Regulations as well as the lengthy military oath, which each man now recites in front of the assembled troops.

The next day Ivan and many of his draft were issued better quality uniforms and jackboots, and from this they gathered that they would be going to Germany. True enough, on the following morning all were marched off to the station behind a regimental band and herded onto a train. The conditions were far from comfortable. The recruits were crowded into covered wagons in which wooden tiers had been erected, and these hard boards acted as beds; not that there was room enough for them all to lie down at the same time. While some slept, the remainder stood or sat around singing or talking. Meals were cooked in a special boxcar attached to the train and eaten during halts at wayside stations. The journey across Poland and East Germany continued much the same as before, but the most stringent security precautions were taken. The doors were locked, the windows covered, and the train stopped only in dense forests. At last, after about 10 days, they arrived at their destination. Ivan found himself lined up with many others while officers sitting at tables divided up the draft to various units.

A few hours later, Ivan and about 50 others were on the way to their new unit, a motor rifle battalion of a tank regiment. Ivan's new home was a big *kaserne* on the outskirts of a German town not far from Berlin.

The barracks built by Hitler were more spacious than anything which Ivan had known in the Soviet Union. He soon found, however, that the barrack area was more like a prison, being cut off from the outside world by a high wooden fence. No one was allowed out of the barracks, except on duty, and the only glimpses of the outside world were through the chinks in the fence or when moving by truck to the local training area. Ivan found that there were many other restrictions too—no fraternization with the local population, no alcoholic drinks, and no girls; even the few Soviet women in the barracks were officially authorized to associate only with the officers.

Long Days

Ivan was given little chance to brood over his sorry lot, and, anyhow, from as early as he could remember he had been taught that the state was always right. The days were long. Reveille was sounded at 0600 and only 5 minutes later Ivan had to be outside dressed in physical training uniform. Breakfast consisted of soup with bits of meat in it, black bread, and tea with sugar. The morning training period lasted until 1400, when there was a break for dinner. Dinner was somewhat more ample than breakfast: Ivan had *borshch* (vegetable and meat soup), fried meat, and *kasha* (porridge made from millet). Tea and black bread were also issued. Coming from a collective farm, however, Ivan felt that he was not getting enough to eat. This was because, as a civilian, he had eaten an unbalanced diet of potatoes and bread and had not as yet

adjusted himself to the more balanced Army diet. In fact, he was probably eating better than he had before, either on the farm or while serving in the Soviet Union. He knew that he was entitled to a butter ration and was rather rankled because it did not appear to be issued to him, not realizing that it had already been used in the preparation of the food. After dinner, he had a rest period followed by 3 more hours of training and weapons cleaning. At last came supper: mashed potatoes, cabbage, bread, and tea. This was followed by political instruction or "hobbies," which lasted until the time came for rollcall.

This was followed by the "evening walk," when the various platoons marched around the parade ground, each platoon singing at the top of its voice a different patriotic song—a strange and incredibly noisy performance.

Through the winter months, one day followed the next with little to break the monotony until April came and a fresh impetus was given to the training by the arrival of an inspecting team from Moscow consisting of several well-known generals.

The regiment was drawn up on parade and the inspectors went around asking each man if he had any complaints. Later, standards of political training, drill, shooting, and physical fitness were tested. In one of the tank battalions of the regiment, there was a company sergeant major who was an excellent shot with both the tank gun and the machine gun.

During the inspection, this company sergeant major was changed from tank to tank so that the battalion got excellent results in marksmanship. Ivan had heard that during a previous inspection his commanding officer had been reprimanded for the large number of entries on the men's conduct sheets. This is not surprising in view of the fact that practically all crimes, whether serious or insignificant, are dealt with summarily by officers at all levels. The commanding officer, however, had learned his lesson and had recently taken to punishing the men with extra fatigues or severe reprimands which were not entered on the cards. As a result, the inspectors found only "10 punishments and 52 commendations" had been given during the year.

Field Training

Shortly after this, the entire division left winter quarters and moved out by night to a large training area near the Elbe River. Once more they were isolated from prying eyes, as entry to the area was forbidden to all Germans. Here, Ivan lived in a tent and saw for the first time all the vehicles, tanks, and self-propelled guns of his regiment.

Training in the summer camp from April to July was fairly similar to winter training, but as autumn approached more and more troops were involved in the exercises until in early October the entire division moved to a concentration area and was joined there by other Soviet units. The main maneuver of the year was about to begin. Ivan did not really know what it was all about, but for 7 days and nights he slept in the open or did not sleep at all, sometimes carrying out mock attacks (with tanks and artillery laying down real covering fire), at other times wading, swimming, or rafting across rivers with the assistance of local materials, while Soviet engineers built ponton bridges for the tanks and trucks. He became accustomed to the whine of the *MiG-15* passing low overhead and the roar of the tanks as they moved across the countryside. He also became accustomed to food at irregular intervals and the continual need to dig in and camouflage.

It was with great relief that the end of the exercise signaled the return to the comparative comfort of winter barracks, where immediately Ivan found himself in the midst of cleaning up and preparing

for the Soviet "Holy Day," the anniversary of the October Revolution—celebrated, as it happens, on 7 November.

It was now about a year since Ivan had left the Soviet Union; the class due for release was being sent back and new recruits were arriving. Ivan's second year would have been much the same as his first, but suddenly in March 1953, a tenseness fell on the Soviet Army; Stalin was dead; leave was stopped—not that this affected Ivan because as a conscript he did not get any—but perhaps here at last was something to change the dullness of his life. New names appeared: Malenkov, Khrushchev, and others; but after a time life drifted back to the weary old ways and the date for summer camp came around again.

In Berlin

Eight weeks later the regiment was suddenly alerted and moved out almost immediately for Berlin—the date was 17 June 1953. On arrival, an incredible sight met their eyes: crowds milled around the street, Communist posters had been obliterated and Communist headquarters stoned. The "impossible" had happened: here was a spontaneous public revolt against a Communist dictatorship. Ivan was given strict instructions not to open fire and remained unperturbed when a few stones were thrown at him and even when he saw two youths haul down the "Hammer and Sickle" from the Brandenburg Gate and raise the West German flag. The tanks, however, soon cleared the streets by advancing steadily on the crowds.

Later, the Political Officers informed their classes that the riots had been sponsored by enemy agents, but Ivan was accustomed to their themes and had his doubts. Two or three times a week he and his platoon were assembled in a lecture room and harangued by the *Zampolit* (the company political officer) or one of his "agitators." The subject matter varied little; the history of the Party, the benefits of communism, the life of Stalin, or the warmongering of the West. Ivan was bored; the references made to agriculture in the Soviet Union were, to his knowledge, crude distortions, but there was little he could do. He had nowhere else to turn for the true facts, and fear of "informers" effectively sealed his lips when with his comrades. While the *Zampolit* droned on, Ivan dreamed of home, Mother Russia, girls, and vodka, and wished they were not so unobtainable.

Little did he realize that at that very moment Lieutenant Dmitriev was reading the latest orders issued by the army commander, which authorized fraternization with the German public for the first time since 1945. Troops were now free to leave the barracks and visit cafes and dancehalls in off-duty hours, and there were several other minor concessions on the burdensome restrictions which, until then, had been "essential to the security of the Soviet state."

Ivan and a few friends took advantage of the new rules at the first opportunity; they got drunk, were involved in a fight with Germans over some women, and ended up with 10 days in the guardroom. Other similar incidents occurred daily and it was rumored that only organized parties would be allowed out. Fatalistically, Ivan thought that his pay of about 7 dollars a month would never have lasted very long anyhow. He thought of Lieutenant Dmitriev, who received about 250 dollars a month, but did not feel envious: after all an officer had to remain in the Army for life! He calculated that he had only another year to do, unless he were made a noncommissioned officer, in which case he would have to serve for an additional 12 months. Ivan turned over and went to sleep.

The Knapsack and Pack

Digested by the MILITARY REVIEW from an article by E. T. Renbourn in the "Journal of the Royal Army Medical Corps" (Great Britain) January 1954.

IT MAY be of interest at the outset to say a few words concerning the origin of some terms linked for so long with the various parts of the soldier's equipment. The word "knapsack" is found for the first time in the English language about the year 1600, and is derived from the Low German *Knappen-Sack*, meaning a food bag. During the first half of the seventeenth century, it was commonly referred to by the Saxon derivative *Snap-Sacke* (snap or provender). The soldier's "haversack" is the equivalent of the *Sarcina* (Latin, a bundle), or the osier basket of the Roman soldier which, during the march, was often carried at the end of a forked stick or a spear. The term first appears toward the end of the seventeenth century as the French *abresac, habresac,* or *havresac,* and originates in the Low German *Hafer* or *Haber-Sack,* meaning an oat sack, as commonly used for horses. The word did not appear in English until the end of the eighteenth century, and is still used in the Westmorland dialect as havercake or oat cake. We first hear of "canteen" in 1744; the word appears to be derived from the Italian *Cantina,* meaning a wine cellar, or a receptacle for liquids. References to the word "webbing" do not appear in military dictionaries of the last century, but the following is noted in 1745: "Welch Webbing—a thick sort of woven flannel of which soldiers' clothing is chiefly made."

Seventeenth Century

The first British "Commission on Uniformity of Arms and Armor" met in 1631 and, after deliberation, introduced a sealed pattern of arms and accouterments. As a result, the powder charges of the musketeer were carried in a bandolier and the bullets kept in a bag or loose in the pockets. A knapsack of canvas or fur was carried over one shoulder. Although by this time armor had almost completely disappeared, it was still being worn by one or two regiments; but we are told by General Monk, later the first Duke of Albemarle, that "the defensive Armor of a musqueteer is a good courage." The cuirass (French, *cuirasse*—a leather jacket) worn by the cavalry of Sir Arthur Heselrig's Parliamentary Regiment was of bright iron shell, and received from the Royalist soldiers the nickname of "Heselrig's lobster."

The pay of an infantry soldier in Cromwell's army was a mere pittance of about eight or ten pence a day, of which sixpence was put aside for his "subsistence"; and for this he was expected to march a full 12 miles or more. Although in the times of the New Model Army, discipline must have been rigorous, there is evidence that "Pack Boys" and pack animals were employed for carrying the soldier's load. Sir James Turner, when speaking of this period in his *Pallas Armata,* written in 1670, tells us as follows:

And although I joyn freely with him in his opinion, that the Souldiers should not carry such burthens as the Romans did of old, yet I would have neither Horse nor Boy allowed them; it is too much, that the Custom of later times, hath eas'd most of them of the burthen of defensive Arms, and therefore every one of them may, and should, carry his own knapsack, and four or five days provisione of meat, with a Hatchet at his girdle, which I see too much neglected, on this side of the Sea.... Though you allow every Souldier two pounds of Bread and Cheese every day,

and God knows, he gets not so much, many times in four days. . . .Suppose he hath a couple of shirts and a couple of Stockins, and a pair of Shoos in his knapsack (and how many Souldiers have all of these), and a Hatchet, I say all of these will not weigh as much as a Head-piece and a Corslet, and he therefore may be well enough be obliged to carry them.

Eighteenth Century

In 1752, Sir John Pringle, physician to the Duke of Cumberland, published his classic on military hygiene, and this became the standard work in England and on the Continent for almost 100 years. We are told that "the life of the foot soldier, is divided between two extremes of labour and inactivity. . . . Sometimes when he is ready to sink under fatigue, having his arms, accouterments and knapsack to carry, he is obliged to make long marches, especially in hot or rainy weather." Apart from this statement, Pringle expressed no interest in either the weight of the load, or its mode of carriage.

During the American War of 1775-83, the British soldier met the enemy in a fashion aptly described by a contemporary, Colonel Lloyd:

We borrowed from Germany cross belts which compressed the chest but had the disadvantage of throwing the sword to the rear, and to knock against the calves and cartridges, and to quarrel with the havresack; long gaiters which squeezed the legs and stopped the circulation in that useful member of the foot soldier, stocks which forced his head up even with the sun in his eyes, curl papers and tight shoes.

When the unpopular "queue" was done away with in 1808, the stocks became even higher. After the war, the Board of General Officers produced an improved pattern of infantry accouterments. The single or crossed shoulder belts became narrower and lighter but remained of buff leather. The magnificent large ornamental buckles disappeared and were replaced by a small, but handsome, regimental breastplate, positioned where the belts crossed in front.

From time immemorial, the movement of armies has been impeded not only by the weapons and equipment of the soldier, but also by women and other Personalia of the Camp. Sir James Turner, in his inimitable style, wrote again as follows:

. . . The Second Classe of Women is of those who ride on horseback, and these must ride in no other place than where the Baggage of the Regiment, to whom they belong, marcheth; but they are very oft extravagent, gadding here and there, and therefore in some places they are put into companies, and have one or more to command and over-see them, and these are called in Germany Hureweibles, *Rulers or Marshalls. I have seen them ride, keep Troop, rank and file, very well, with that Captain of theirs . . . and a Banner with them, which one of the Women carried. . . . They provide and dress their husband's meat . . . they bring in Fewel for fire, and wash their Linnens. . . .That famous Duke of Alva . . . they say . . . he was given permission for Courtizans to follow his Army, but they were to ride in Troops with Banners. They were divided into several Squadrons according to their quality, and that was distinguished no otherwise by the difference of their beauty, faces and features.*

An account of an English family, by the French General Lejeune, during the Peninsular War of 1808-14 reads as follows:

The Captain rode first on a very fine horse, warding off the sun with a parasol. Then came his wife, very prettily dressed with a small straw hat and riding a mule. Besides madam walked her Irish nurse carrying in a green silk wrapper, the hope of the family. Last in the procession came

a donkey laden with much miscellaneous baggage which included a tea kettle and a cage of canaries; it was guarded by an English servant in livery, mounted on a sturdy cob.

Sir George Bell wrote the following during the same period:

The multitude of soldiers' wives stuck to the army like limpets; averse to all discipline, they impeded our progress particularly in retreats. They became the subject of a General Order for their own special guidance. Under no control, they were always first mounted and away, blocking up narrow passes and checking our advance with their donkeys.

Early History of the Knapsack

Since the time of Cromwell, the equipment of the British soldier has included a knapsack for "essentials" and a haversack for "necessaries"; but it is to be noted that the canteen for water—"bluejack" of this period—was not issued to the soldiers during the Civil War itself. Until near the end of the eighteenth century, the knapsack was a bag of canvas, fur or cowhide, slung over the musket or the right shoulder. The cost was about nine pence in the time of the Civil War rising to a few shillings during the next two centuries. The bag was often painted the colors of the regimental facings, with insignia on the back. After an order of 1798, the knapsack was carried on the soldier's back by two shoulder straps.

In 1805, a Mr. Trotter, who supplied the Army with most of its equipment, introduced a new type of knapsack. This was a rectangular box of wooden framework, covered with black canvas. After this date, regimental facings and insignia were seen much less frequently. Several modifications of this equipment were issued during the next 50 years. In 1824, regimental records mention a new pattern, and that of 1827 was said to be smaller and lighter. The knapsack of 1829 had a stronger wooden framework, with a pocket in the flap. Still another smaller pattern appeared in 1857. These various modifications were, however, of little practical value to the soldier. Until 1871, the knapsack was itself regarded as a "camp necessary" to be provided by "off reckonings" or "stoppages" from the soldier's pay; but after this it became an article of "equipment."

In the first half of the nineteenth century, the British soldier carried his knapsack high on the back, and independently of the crossed belts, by shoulder straps passing high in the armpit to the lower angles of the knapsack. The greatcoat or blanket was kept in various positions on top of the knapsack. It would appear that the stovepipe shako hat worn at this time must have sometimes been knocked off, and movements of the neck interfered with, during rifle fire or crawling. A heavy ammunition pouch was situated over the rump or hip, and the weighty wooden water canteen—later called a water bottle—was slung from the left shoulder; and from the right shoulder was slung the haversack, with its rations, extra ammunition, and odds and ends. However, it is seen from Figures 1 and 2 that the position of these pieces of equipment varied somewhat. No attempt was made to co-ordinate the different accouterments, or to balance the knapsack with some load in front. In order to prevent the straps slipping over the shoulders, the former were joined by another strap, buckled tightly across the chest (see Figure 1), and at a level sometimes laid down by an order. This chest strap produced so much distress that it was invariably unbuckled on the march; and we are told that at "the double" the soldier had to "put his hand on his cap, his other on his pouch —and what became of his musket!" The coat was tight fitting, and the neck fettered by a tight collar with its leather

stock—"an evil device which constricted the neck and tended to apoplexy."

An indictment against a badly balanced load of about 60 pounds, carried by soldiers during a long retreat, is given by Rifleman Harris, who was an orderly to Major General Robert Craufurd during the retreat to Corunna, early in the Peninsular War (December 1808). He recounts that:

the knapsack was our worst enemy in this prolonged march. Many a man died, I am convinced, who would have borne up to the end of our retreat but for the infernal load we carried on our backs. My own knapsack was my bitterest enemy . . . more than once I felt that I should die under its deathly embrace. The knapsack in my opinion, should have been abandoned at the very commencement of our retrograde movement . . . if by such loss we could have saved the poor fellows who died strapped to them on the road.

Even during the Napoleonic era, discipline was not sufficiently rigid to prevent soldiers carrying in the knapsack and haversack loot and other spoils of war, which could hardly be covered by the term "essentials" or even "necessaries." In the memoirs of the French veteran Sergeant Bourgogne, written after leaving Moscow in 1812, we are told the following:

I spent some time in making an examination of my knapsack which seemed too heavy. I found several pounds of sugar, some rice, some biscuits, half a bottle of liquer, a woman's chinese dress embroidered in gold and silver, several gold and silver ornaments—amongst them a bit of the Cross of Ivan the Great—at least a piece of the outer covering of silver gilt, given me by a man in the Company who had helped in taking it down. Besides these, I had my uniform, a woman's large riding cloak (as I could not guess how it was worn, I imagined its late owner to be more than six foot high), then two silver pictures in relief, a foot long and eight inches high. I had besides, several lockets, and a Russian Prince's spittoon set with brilliants. These things were intended for presents, and had been found in cellars when the houses were burned down.

This truly amazing kit was apparently carried about by the intrepid sergeant for about a month, both on the march and into battle.

Whitehorne, in his *History of the Welch Regiment*, quotes Sir William Butler, who wrote of the period preceding the Crimean War:

It was impossible not to love these old soldiers. They had so many splendid qualities. I call them old, in reality they were all under 40 years, but they were old in every other sense of the word. If you asked any of these men, when in hospital, what was wrong with them, they would usually answer—'Only them pains, Sir,' and if you asked what had produced the pains, they would invariably say it was the heavy belts and cumbersome pouches they had to wear for twenty four hours on guard. It was true, our stupid regulations broke down these fine soldiers long before their time.

Whitehorne quotes one of these old soldiers, a certain William Elcock of the 69th Regiment, who told him that "the knapsack with Field kit was always carried on Commanding Officer's parades and on Field days. I bear the marks of the knapsack straps on my shoulders to this very day."

The Crimean War

During the time of the Crimean War (1854-56), an attempt was made to improve the infantry equipment, but the British Army still wore the old pattern in Russia. In 1857, Colonel Hardinge (later Commander in Chief at the Horse Guards), president of the Field Artillery and Equipment Committee, wrote:

The waterproof havresack has been recommended for trial, and has borne the test of use in Crimea with advantage . . . a tin water canteen, leather covered, to supersede the Italian wooden water canteen, has been ordered to be made and recommended for trial. . . .No article has

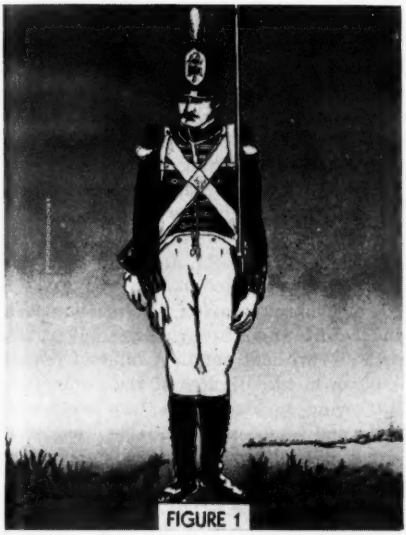


FIGURE 1

been made generally so complained of as the wooden water canteen . . . leaky, weighty and pervious to heat in the extreme.

A contemporary description of the issue equipment of 1857 (see Figure 3) reads:

The cross belts and strap, with 40 to 60 rounds, are not only tight across the chest, but the pouch moves and bumps against the man's posterior. The shoulder straps of the knapsack cut the shoulders; and swelling, weakness, and numbness of the arms or hands, lasting up to twenty four hours is common after a march. So great are the discomforts, loss of strength, and pressure on the nerves, muscles and blood vessels, that, all nations of Europe but ourselves, have of late altered the system of packs and accoutrements. Various propositions have been put forward for a number of years, but none have been adopted, . . . the present knapsack is worst of all, and if we cannot recommend an absolutely perfect one, there is no reason to be content with the present one.

It is obvious that "pack palsy" of the infantry soldier is no new disorder.

The Royal Commission of 1858 brought to light the constant resistance by the military to innovation and improvement. As early as 1839, James Berington, a retired Army veterinary surgeon, produced a knapsack clearly an improvement on its predecessors. After a number of troop trials, apparently successful, and in spite

FIGURE 2

of the matter being brought to the attention of the Director General, Army Medical Department, and Wellington himself, the equipment was turned down. In despair, Berington presented his case in some detail in the *Lancet* of 1849. Sometime before 1858, the equipment again proved its value on trials, and it was praised by the

Commission of 1858. Three years later, Army surgeons Martin and Moore spoke highly of its value to the soldier. Nevertheless, the knapsack was never accepted, and soon forgotten.

The Turning Point

The turning point in the history of personal load carrying equipment was reached during the period of 1865-68, throughout which time there were four meetings of the Committee appointed by Lord de Grey. This *Committee Appointed to Inquire Into the Effect on Health of the Present System of Carrying the Accoutrements, Ammunition and Kit of the Infantry Soldier* had as its president Major General Henry Eyre, and the medical representative was Dr. Edmund Alexander Parkes. In the appendix to the first report, we find a paper by Dr. McLean, Deputy Inspector General, and Professor of Military Medicine at the Army Medical School at Netley.

Discussing the prevalence of disease of the heart and lungs in soldiers, he dismissed rheumatism and alcoholism as important factors, and came to the conclusion that the essential cause of these afflictions was the heavy load carried by the soldier, and the irrational method of carrying it. During the presentation of the paper, the heart of an old soldier was demonstrated, showing a white spot or "corn," which, the Professor believed, was not exceptional in old soldiers, and which he clearly ascribed to the pressure and friction of the crossbelts and chest strap of the soldier's equipment. A similar conclusion to the cause of the "soldier's heart" had already been reached in 1862 by Sir William Aitken. However, today it is well known that the "corn" or "milk spot" of McLean is, in fact, a manifestation of rheumatic heart disease, a disorder of young life, and in no way caused by the severe exertions or activities of the soldier. The Professor pointed out that he had discussed the matter of the soldier's load with numerous military medical officers, but very few had paid much attention to the matter.

During the first meeting in 1865, the Committee examined a large number of packs, including the issue Prussian and French models, and decided finally that four packs were worthy of trial. These were Lieutenant Colonel Sir Thomas Troubridge's yoke valise, Lieutenant Colonel Carter's plan, the Prussian pack, and a system devised by the Committee (see Figure 3). Large numbers of these four packs were distributed to nine regiments, including Marines. In August 1867, a physiological trial was carried out by medical officers. Twelve men were used as experimental subjects, and pulse and respiration rates taken before and after a 2 hours' march wearing the various packs, and before and after running 500 yards, with and without packs. A table of results is given in the Minutes of the Committee, but owing to changeable weather conditions and other uncontrollable factors, it is not possible to draw clear-cut conclusions as to differences between the packs. During the troop trials, a series of 23 questions was given to the men using the various packs, but a perusal of these suggests that it must have been sometimes difficult to give unbiased answers.

During the various lengthy discussions, the Committee put forward certain principles required of an ideal personal load carriage equipment. These were as follows: the weight to be distributed over a wide area; the weight of the knapsack behind to be balanced by the weight of the pouches in front; all loads to lie as close to the body as convenient, and as near to its center of gravity as possible; no compression of the armpit or the chest; the total load carried to be approximately 45 pounds. The equipment produced by Professor Parkes had part of the weight thrown on the hips by two straight iron rods. The Committee's equipment was a

modification of that of Troubridge, who, in 1857, became first Director of Army Clothing, and who had been experimenting for about 15 years on the problem of load carriage by the soldier. The original Troubridge valise plan was based on the principle of the milkmaid's yoke—the weight being again transmitted to the hips by metal rods. However, the Committee decided that metal rods in any form were unacceptable for military equipment. bag. The load was thus borne by both the shoulders and pelvis; and in full equipment was so well balanced between the front and back that, it was claimed, the waist belt could be unbuckled on the march. There were no binding straps in the armpit, and the chest was at last completely freed from its constricting bands. An objection noted by the Committee was the large area of the back covered in marching order, with consequent poor

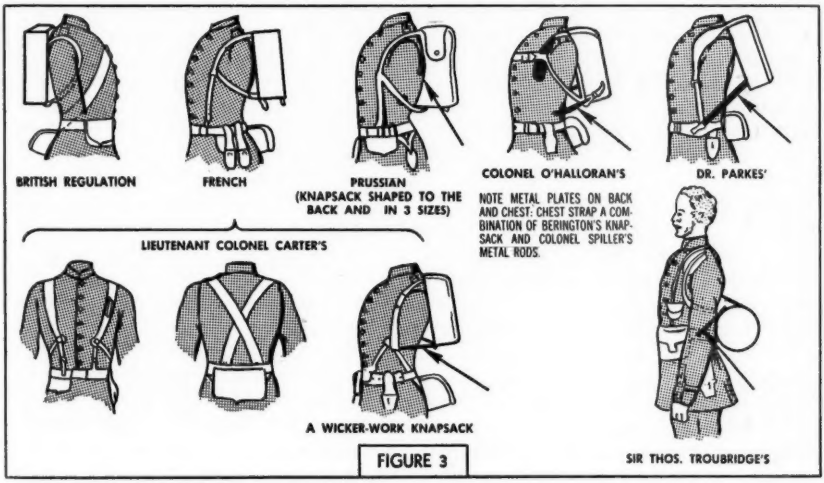

BRITISH REGULATION
FRENCH
PRUSSIAN
(KNAPSACK SHAPED TO THE BACK AND IN 3 SIZES)
COLONEL O'HALLORAN'S
NOTE METAL PLATES ON BACK AND CHEST: CHEST STRAP A COMBINATION OF BERINGTON'S KNAPSACK AND COLONEL SPILLER'S METAL RODS.
DR. PARKES'
LIEUTENANT COLONEL CARTER'S
A WICKER-WORK KNAPSACK
SIR THOS. TROUBRIDGE'S

FIGURE 3

During the period 1865-68, the Committee continued its search for suitable pack equipment, and the pack in the lower right-hand corner was adopted with some modifications.

The new equipment designed by the Committee received very favorable reports during the troop trials and answered the Committee's requirements. It consisted of a black waterproof canvas bag or valise, worn over the small of the back, and supported from the shoulders by straps (see Figure 4.) Pouches, straps, and waist belt were pipe-clayed. The ammunition pouch was removed from its inaccessible position on the back, and replaced by two pouches—holding 20 rounds each—which, when filled, approximately balanced the contents of the valise behind. An additional 30 rounds were carried in a ball ventilation and excess perspiration. It was pointed out, however, that this defect had to be accepted, and with suitable adjustment of the side straps, sufficient ventilation could be obtained. For the first and last time in British military history, the valise (or knapsack) was carried low on the back. We are told that "after several years' experience, the Committee believe that they have found the best, and perhaps the only, way in which military loads can be carried with perfect freedom to the chest."

In 1869, the third edition of a textbook by Professor Parkes appeared. This

contained a valuable and enlightening section on the problem of marching and load carriage by the soldier. A detailed description of the new valise equipment was given, together with an analysis of various methods available for military load carriage. Parkes fully realized the importance of clothing and footwear in connection with personal equipment and load carriage; as well as the significance of foot hygiene, rest, sleep, food, training, climate, and terrain, in relationship to the rate of marching and distance covered. In fact, there is little known today of the problems of the marching soldier that was not well understood by this acute observer of military hygiene, whose work may be regarded as the most important in the early history of load carriage.

In the same year, letters appeared in the *Lancet*, by Assistant Surgeon Myers and Surgeon Major Robinson, dealing with the relative importance of organic disease, and heavy knapsacks, tight tunics and collars, in the causation of aneurysm of the blood vessels in Army personnel. Although the observations appear somewhat naive in the light of modern knowledge, they are, nevertheless, to be regarded as minor landmarks in medical history. The ideas of McLean and Aitkin on the soldier's load as an important causal factor in the "soldier's heart," were soon refuted by a book published by Myers in 1870, and by a report in the following year by Da Costa of Philadelphia. The former based his conclusions on observations made on British troops in India, and the latter on cases studied during the American Civil War. Both showed that the commonest cause of so-called cardiac disease of the soldier was the "irritable heart," a disorder due, not to organic disease, but to the physical and psychological stresses of service life. Strangely enough, this view did not receive general acceptance, and was forgotten for about 40 years, to be rediscovered as "disordered action of the heart" of World War I and the "effort syndrome" or "combat exhaustion" (American terminology) of World War II.

The issue of the valise equipment was delayed by the trials of the new *Martini-Henry* rifle, and did not make its appearance until 1871. Nevertheless, we are told by a commentary in the *Lancet* of 1873 that "it is difficult to understand why there should be so much delay in replacing a portion of the soldier's accouterments which is as unsuited to the present day rapid movement of war as *Brown Bess* (the fire-lock abolished in 1838) to a rifle range." In 1876, regulations still mention regiments in possession of the valise equipment, and others having the knapsack equipment.

Valise Equipment

During the next few years, the work of the English Committee and of Professor Parkes became well known on the Continent and in America. Morache, in France, in his textbook on military hygiene, published in 1874, mentioned the current work of Judée on military accouterments, and gave a complete description, including diagrams, of the British valise equipment—*le sac-valise anglais*. He described a trial of this equipment carried out by French troops, with very favorable results. Both Morache and Parkes were conversant with the dynamics of load carriage, with the work of the Weber brothers and Meyer on the mechanics of the human body, and the classic work of Duchenne on the mode of action of the muscles of the body shown by electrophysiology.

Shortly after the appearance of the work of Morache, an important textbook on military hygiene was published in 1877 by the German hygienists, Roth and Lex. This gave a long and detailed description of all military clothing and equipment of the period, both German and other nations.

As in the text of Morache, a great deal of space was devoted to the work of Professor Parkes and the British Committee of 1865-68, and a detailed description with diagrams was given of the valise equipment of 1871. This was highly regarded, and in return for the compliment paid to the Prussian equipment in England, a trial was carried out on the valise equipment—*Die Englische Gepäck*—in Germany by a Prussian and a Saxon regiment, and with results similar to those obtained in France.

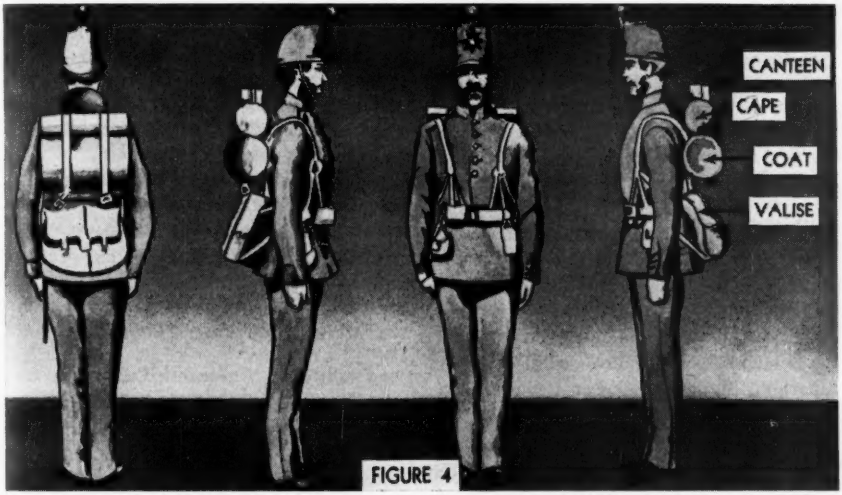


FIGURE 4

The approved knapsack, shown above, made its appearance in 1871. At first very popular, it was not long before dissatisfaction caused new studies to be started on the pack.

Trials

In spite of the satisfaction expressed by the Eyre Commission with its work, the valise equipment soon came up for criticism, and during the period 1879-81 there appeared two reports by another Committee on Equipment. The new president was Major General Steele. Professor Parkes had been replaced by Surgeon General McKinnon, and during the interim period Sir Thomas Troubridge had died. The Committee was asked to investigate the criticisms, and to examine carefully two new equipment designs that had been placed before them; one by a Colonel Barratt, and the other by Surgeon Major Oliver, whose plan had been praised in Canada. The two packs were put out to trial together with the valise equipment, and the units concerned were given 23 questions to answer, similar to those used in the trials of 1865-68. An objective test used during the trials was that of rifle fire, but the results were not appended and it does not appear that the accuracy of fire was measured. One notes with tolerance, tempered by experience, that the two units issued with Barratt and Oliver equipment gave completely contradictory opinions. Furthermore, a rift between the soldiers and physiologists made its appearance for the first time; and during the trials, Dr. Oliver made frequent complaints to the chairman, and later to the president, that his equipment was not receiving a fair test.

At the end of the trials, the Committee came to the conclusion that neither of the new packs was suitable for acceptance,

and recommended retention of the valise equipment, with the following modifications:

1. The valise to be of brown waterproof canvas, and to open at the back as recommended by Barratt.

2. The equipment to be made of brown leather.

3. The "havresack" to be carried in the valise.

4. The ball bag to be dispensed with.

5. In order to free the valise from the back, and to prevent the straps slipping down the shoulders, the supporting straps were to be attached to the valise close to the mid line and below its upper edge (as in a rucksack) instead of to its upper corners.

The following rider was added to the second report: "I do not agree with the Committee that the present valise equipment be retained for the present issue. I consider the principle faulty, and that the principle of Oliver, as modified, is far superior. Signed: Surgeon General McKinnon."

In spite of the judgments of the two Committees, we find that a somewhat different personal load carrying equipment appeared in 1882. This was essentially the same as that of 1871, but the valise was now carried in its earlier position high on the back, with the greatcoat below and the canteen (or mess-tin) in between. The pouches were flatter, set rather higher on the waist belt, and were pipe-clayed.

As a natural consequence of this new position, supporting straps again passed through the armpit and the lateral view somewhat resembled the arrangement seen in the present 1944 equipment. The valise measured about 15 by 12 by 3½ inches, and had the disadvantage of not being detachable. In each pouch there were 40 rounds of ammunition.

By 1888, still another improvement, known as the "Slade-Wallace" valise equipment, had appeared. The valise was now smaller, detachable, and the armpit was freed of annoying supporting straps; but it seems clear that the valise was not stable during "the double." Lack of supporting straps led to poor balance between valise behind and the pouches in front. The shoulders were pulled back, and stability could be obtained only at the expense of a very tight waist belt which was, nevertheless, dragged up on the man's stomach. At every halt, men could be seen hitching up the shoulders in an endeavor to get the pack in its proper place and the buckle of the belt down again. This fault, apparently absent in the 1871 equipment, was to be seen, and complained of, in most forms of British equipment which followed, even up to the present day.

With the appearance of the *Lee-Metford* rifle in 1892, the number of rounds was increased to 100, equally divided between the two pouches.

End of Nineteenth Century

Toward the end of the nineteenth century there was a determined effort in Germany to reduce the load carried by the infantry soldier. In 1894, a formal invitation was extended by the military authorities to the medical students and professors at the Frederich Wilhelm Institute to put on uniform and carry the campaign load of the infantry soldier. A series of marches was carried out, over distances up to 28 miles a day, under various weather conditions, and with loads of 48 to 68 pounds. As a result of the trials, it was concluded that, for the maintenance of health and efficiency, the total load carried should not exceed 48 pounds; and following a Cabinet Order of 1895, the weight was decreased from 68 to 62 pounds. These German trials are to be considered the first serious attempt to investigate the physiological background of the soldier's load.

During the period that work on load carriage was proceeding in Germany, Laveran, Professor of Military Hygiene at Val de Grâce in France, found time to write a textbook on military hygiene while continuing his renowned researches on malaria. This was published in 1896 and, like its predecessors, gave an excellent analysis of the various factors concerned in the requirements of military clothing, marching, and of load carriage. Laveran quoted the German trials, and gave a description with diagrams of the valise equipment of 1871. A great deal of reference was made to this text by succeeding authors, particularly in America.

The Soviet Cruisers

Digested by the MILITARY REVIEW from an article by Oscar Parkes in "The Navy" (Great Britain) March 1954.

THE growth of the Soviet cruiser force, which now includes about 20 large or sizable ships, has become quite a naval problem. Not that a score of cruisers has anything like the significance of 10 times that number of submarines, but all the same the knowledge that a fleet of potential commerce raiders is increasing while our own cruiser force has diminished within recent years, cannot be accepted with equanimity. Some of these 20 ships are in the Black Sea, some in the Far East, while the latest and largest are in the Baltic and White Seas.

A large proportion of the Soviet fleet is composed of foreign vessels, mostly of German, Italian, and Japanese origin. Of the cruisers, the *Stalingrad* in the Black Sea (the ex-Italian 7,527-tonner *Duca D'Aosta*), and the *Admiral Makarov* (formerly the German *Nürnberg* of 7,600 tons), make occasional cruises in the Baltic. Some lists show the *Poltava* (ex-*Lutzow*) and *Petropavlovsk* (ex-*Seydlitz*), but both of these are employed as hulks and are not likely to be completed as seagoing ships despite the Soviet propensity for keeping every sort of antiquated hull in some form of mobile condition.

The Soviet-built ships comprise:

Type A: *Krasni Krim* (Baltic). Type B: *Krasni Kavkaz* (Black Sea). Type C: *Kirov* (Baltic), *Voroshilov* (Black Sea), *Molotov* (Black Sea), *Kalinin*, *Kaganovitch* (Far East), *Maxim Gorki* (Baltic). Type D: *Chapayev*, *Chaklov*, *Frunze*, *Kuibyshev*, *Zhelesnyakov* (two in the Black Sea and the remainder in the Baltic). Type E: *Sverdlov*, *Cherbakov*, *Zhdanov*, *Voikov*, *Ordzhonikidze*, *Dzorzhinski*, *Alex. Nevski*. (All reported as being in the Baltic or transferred to the White Sea.)

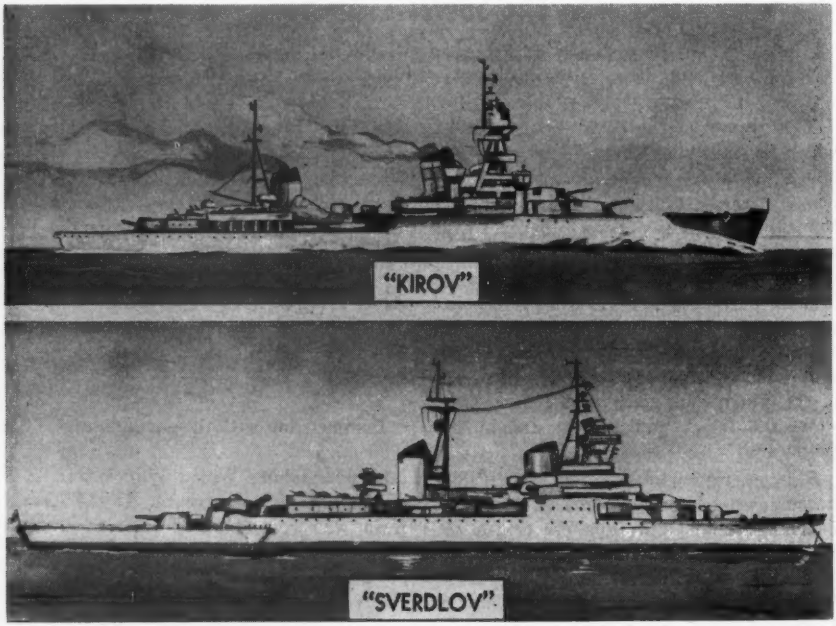
Type A

Commencing with the earlier ships, Type A belongs to a class laid down in 1913, launched during World War I, and then abandoned for some years. As the *Krasni Krim* was well advanced after the revolution, she was completed to the original design and so remains one of the few cruisers afloat with a broadside armament. About 3 years were spent pushing her through her trials and she hoisted the pendant in 1928. On 6,934 tons, she carries fifteen 5.1-inch guns with a broadside of eight, and stowage for 100 mines. Her present speed is said to be a doubtful 25 knots.

Type B

The *Krasni Kavkaz* originally belonged to the same group, but as her condition was less advanced in 1916, when construction ceased, it was possible to redesign

her when work was resumed after 10 years. As a home-grown product, she exhibits some unusual features including a high and much braced tripod forward and a quadruple mainmast supporting two overelaborate cranes, serving a catapult—forerunners of the ridiculous contraption in the battleship *Oktyabrskaya-Revolutia*. In place of broadside 5.1-inch shields, she was given four 7.1-inch in center line turrets, and now carries twelve 4-inch, fourteen 37-mm, and six 21-inch tubes, with stowage for 100 mines. Most Soviet warships are fitted for mine-laying which has long been a special branch of the Soviet naval service. Displacement was raised to 8,030 tons, and her reputed speed is about 25 knots.

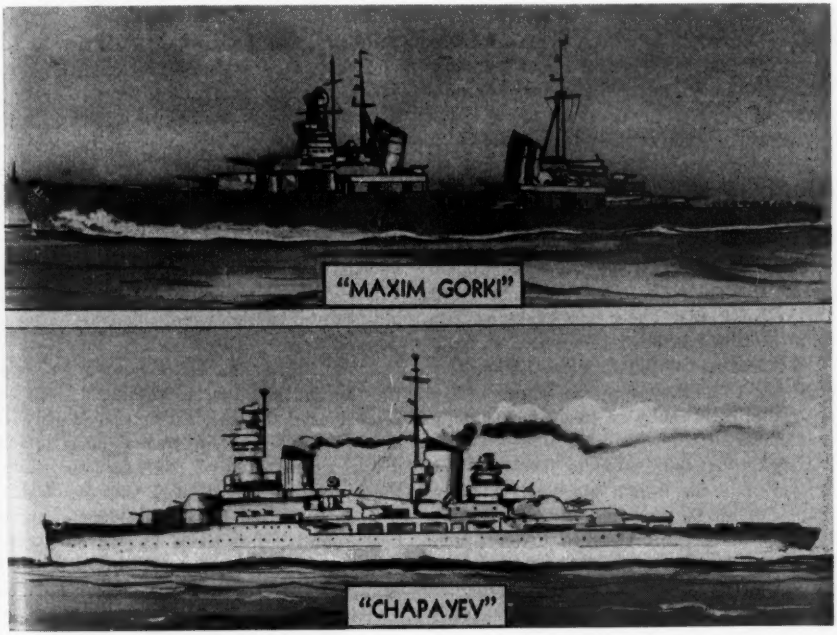


Type C

In 1935, the first of a series of powerful cruisers, the *Kirov*, was laid down at the Ordzhonikidze Yard at Leningrad and completed in December 1938. It is reported that her construction was carried out under Italian supervision and that the design was of Italian origin, although it resembles the French *Montcalm*. In place of the single 7.1-inch of the *Krasni Kavkaz*, she carries triple 7.1-inch in her three turrets, with eight 3.9-inch around the second funnel, and eighteen 37-mm. Amidships there was previously a catapult, but this is now removed and a triple set of 21-inch tubes installed on each beam. A square stern allows for chutes from four sets of rails with stowage for 90 mines. With engines of 110,000 shaft horsepower, her reputed speed is 34 knots, and oil bunkerage is 1,280 tons. Dimensions are 620 (overall) by 58 by 20 feet giving a displacement of between 9,000 and 10,000 tons. Allowing a cruiser block coefficient of fineness of .5, it would work

out at 10,292 tons, but it appears that the Soviets accepted a lower figure in order to get the required speed. A sister, the *Voroshilov*, was built at the Marti Yard, Nikolaiev, during the period 1936-40, and both are distinguished by a heavy tripod fore and aft.

Further units of this type are the *Maxim Gorki* (Leningrad, 1936-39), *Molotov* (Nikolaiev, 1936-41), and *Kalinin* and *Kaganovitch* both built at the Komsomolsk Yard in the Far East during the years 1939-47. It will be seen that these later ships have a tower and pole forward with a light tripod before the first funnel, and a tripod aft. Dimensions are 626½ by 59 by 20 feet with a nominal 9,000 to 10,000 tons. Main armament is again nine 7.1-inch with eight 3.9-inch (6-inch *Maxim Gorki*) and ten 37-mm. Protection is still light, with 2-inch to 3-inch on the belt, 2-inch deck, and 3-inch to 4-inch turrets.



Type D

Five ships of this type, now understood to include the *Frunze*, have been built in the Baltic and were in service in 1950-51. They are considerably larger than Type C and mount 6-inch instead of 7.1-inch guns in their four triple turrets, with eight 3.9-inch, and twenty-eight 37-mm in pairs. They have no torpedo tubes and mine stowage is raised to 160. Dimensions are 660 by 61 by 20 feet which equal 13,800 tons allowing for a .5 coefficient. With engines of 135,000 shaft horsepower a speed of 35 knots is reported. These ships present a very different profile from the earlier classes and resemble the 1939 big Italian cruisers in rig, funnels, and general layout.

Type E

Of this class the *Sverdlov* was present at Spithead in June 1953. Enlarged editions

of the *Chapayev*, their dimensions are: 656/690 (overall) by 71 by 24½ feet which equal 16,300 tons, the noticeable difference being the extension of the forecastle deck to "X" turret aft. There are four triple 6-inch positions with 3-inch to 4-inch gunhouses; twelve 3.4-inch in large gunhouses about 1 inch thick; thirty-two 37-mm in twin mounts; and two sets of quintuple tubes. Protection is not likely to be heavy, with about 4-inch on the belt and a 1-inch to 2-inch on the deck. The usual four sets of mine rails run from the break of the deck aft to two stern chutes, and speed is 34 to 35 knots with a reported 130,000 shaft horsepower.

As offense these days depends not so much upon the number of guns as upon their radar equipment, it was interesting to see that the *Sverdlov* carried both visual range-finders, mounted in cupolas German fashion, as well as a certain amount of radar. There was evidence that some of this has been removed, but even so, the presence of the optical range-finders suggests that they may be regarded as more than a standby in case of electronic breakdown.

Judging by the gunports it would not appear that the 6-inch pieces have more than 50 to 60 degrees elevation. The smaller turret guns thought to be 4-inch are obviously smaller, and identified as no more than 3.4-inch, although dwarfed by their large gunhouses. It is possible that these are gas-tight and air conditioned, and that the 3.4-inch have a specially high rate of fire.

At least six of this class are in service, and another six to eight are reported under construction—very fast, well equipped, and with the huge fuel supply their size warrants, they will have an exceptional endurance. The Soviets have long since realized that they may get a better return for their money by building fast cruisers rather than battleships, and in future North Atlantic Treaty Organization exercises it will be interesting to see what methods are evolved for dealing with hostile cruisers.

At present, the building facilities in Soviet dockyards are being devoted to cruisers, destroyers, and submarines. The Baltic and Marti Yards handle cruisers, with three slips at the former and two at the latter, so five ships could be built at the same time. At Nikolaiev, there are probably two slips capable of handling a *Sverdlov*, but although two *Kirovs* were produced at Komsomolsk, it is doubtful whether anything much larger could be built there without considerable alterations.

A limiting factor in Soviet ship design for the Baltic ships is draught. It will be remembered that when Fisher saddled the fleet with the *Courageous* class their draught was fixed at 23½ feet to enable them to operate in the shallow Baltic waters. In fixing the displacement of these new Soviet ships, there has to be a certain amount of latitude in accepting draught figures, and the *Sverdlov* did not arrive at Spithead displaying her draught marks. But 24½ feet is not far wrong and gives a calculated displacement between 16,000 and 17,000 tons—or a little less than the heaviest United States cruisers of the *Salem* class.

Today the United States depends on the sea to receive the multitude of raw materials we need. Our dependence is so great that enemy action against our shipping could reduce or stop the flow of many key materials.

Admiral William M. Fechteler

The International Staff Officer

Digested by the MILITARY REVIEW from an article by Lieutenant Colonel B. Blood in "The Army Quarterly" (Great Britain) January 1954.

BARRING millennium or catastrophe, it seems that international headquarters will continue to exist, even to flourish, while the eager cadets of today turn slowly into grey-haired generals and plump full colonels. Service in such a headquarters is an experience for which staff colleges, service on normal one-nation staffs, or even keen imagination combined with the former, cannot give comprehensive preparation. It is to help those who in the future find themselves appointed to one of these many-lettered and gilded staffs that these brief reflections have been written.

Those so appointed will do well to realize that, according to their differing temperaments, this service well may be more exacting than any they have experienced. The exaction may not be in the tangible form of a higher output of work, but more probably will make heavy drafts on their capital of patience, tolerance, and power of philosophic adjustment to new situations.

These multinational staffs are a relatively new phenomenon. It cannot be said that Supreme Headquarters Allied Expeditionary Forces in 1944-45 was truly multinational, as the Anglo-Saxon elements were so predominant. However, in the headquarters of the North Atlantic Treaty Organization we now find coexistent a third element, which I will call the "European." We, therefore, have to reconcile three forces: two Anglo-Saxon and the European. Where these forces are in relatively equal strength, stresses arise. It is not my purpose to discuss the high-level national and political implications of these stresses—the task is too great for a short article, and the ground is too dangerous.

Looking at the *three force* problem from the level of the lieutenant colonel or major (general staff officer), there are two main factors to which the individual must adjust himself. The first is the system, the second I will call comprehension.

Modifications Only

Now the system is basically that of the nation which, because of its military contribution, or its strategic and geographic situation, dominates the headquarters—in practice it is that of the commander in chief. It is only reasonable to expect him, with a compatriot as chief of staff, to work through the system to which he has been habituated through many years of service. The staff systems of different nations naturally reflect their different cultures and traditions. Co-ordination of staff procedures effected by NATO cannot erase these differences, which are psychological rather than technical. Since staff officers undergo a thorough training, and are imbued with their own national culture, tradition, and consequent method, they are naturally inclined to think that their methods are best. For certain mentalities resulting from particular types of education, they probably are; and perhaps they have features which are best by any criterion. Nevertheless, assuming that the commander in chief and his chief of staff are men of determined character, it is their system in essential which will govern. It may be possible to introduce useful modifications—but they will remain modifications.

The lieutenant colonel or major (gereral staff officer) may detect what appear

to be glaring faults in the system: but they may well be faults which the nation, in whose system they are embodied, tolerates because they suit its national psychology. Therefore, the keen new staff officer may be well advised not to try to do anything about it; if he does, he may exhaust himself to no avail. He would also do well to realize that few national armies tolerate junior officers showing as much independence of mind as does the British Army.

Therefore, let the newly-appointed officer recognize that the system under which he must work will almost certainly be strange to him; that there will certainly be features which he does not like; but that the system must be accepted because it is that through which his commander in chief works best. He may well, in due course, be able to suggest constructive modifications in the working of his own department, but he should limit himself to such a goal, and avoid being filled with crusading zeal to reorganize the entire headquarters. Before leaving the question of system, I must point out that there is inevitably some inefficiency in the working of a multinational headquarters. Not only are there differences of outlook and language, and many authorities to be consulted on all decisions, but there is usually a formidable hierarchy. In order to meet the demands of various nations for representation at all levels, one finds that there are indeed very many levels, and the lieutenant colonel or major (general staff officer) finds himself at or near the bottom of a many-runged ladder. The imperfections of human nature, which make such headquarters necessary in time of peace, are reflected in their composition. So the new lieutenant colonel (general staff officer) must be prepared to find himself a very small frog in a very large pond. I should say that the writer of this article was temperamentally averse to taking such counsel, and was a sick man by the time his appointment ended.

Comprehension

In case any hint of irony has been detected in my remarks on system, I must say that those on comprehension are most seriously intended. The recent publication of the *Private Papers of Douglas Haig* has shown how easy it is to fail to understand one's allies. No doubt there are those who believe that Haig would, as he thought, have known better than Pétain how to restore French morale in 1917, but I doubt if history will support them. Personally, I do think these *Papers* give a warning which we should heed, if we hope to preserve peace or at worse to fight together.

Comprehension, which I define as the process by which comradeship and co-operation are attained by officers of a different race, entails for most of us an *act of will*. We are beginning to realize that Americans are not wrong if they do not think as we do, despite a so-called common language. We know already that Frenchmen and Italians must be expected to view things differently.

Few Englishmen are equipped by nature or upbringing to be able, subconsciously, to think in sympathy with Frenchmen or Americans. A positive act of will is therefore required—starting with the rudimentary realization that "because he thinks differently, he may not necessarily be wrong."

European and American

It is necessary to comprehend two entirely different cultures—the European and the American. The British officer may instinctively favor one or the other—in which event he must make a positive effort to redress the balance. Or he may have moments in which he thinks one party or the other more sympathetic, in which case he must try to prevent violent oscillation and conceal his feelings. In either event, he will realize that insularity is not necessarily confined to the inhabitants of islands.

I will deal at greater length with the European problem, as in the nature of things, our hosts are normally Europeans. And further, I will deal primarily with the French as representing the Europeans, both because they are at present the leading allied nation on the Continent, and because they are host to the main headquarters with which we are concerned.

But first a word on knowing the Americans—a fascinating subject on which restraint is necessary. On the whole, contacts will probably be limited to service officers and their wives—this limitation can only be balanced by judicious reading. The history of the United States may be brief, but it is crowded, and its main outlines should be studied—I recommend *America—the Story of a Free People.* A book of quite another category—strongly recommended, but to be taken with a pinch of salt—is Gorer's *The Americans.* And I must add one novel—Marquand's recent *Melville Goodwin, U. S. A.*—as a study of the background and psychology of the American officer. Otherwise, I can only repeat that, obviously, American military tradition is not a modified British tradition, but is compounded from many European systems including German.

Thus, the British officer is sometimes surprised to find that his American colleague tends to be more rigid and to depend rather more on the book, and also to be rather more conscious of rank.

There is far greater opportunity to know your continental hosts—which will both increase your value as a staff officer and enlarge your entire human horizon. Language is obviously the first problem—that of the host must be mastered—in Supreme Headquarters Allied Powers Europe and the Central Europe Headquarters, this means French. But many able linguists still fail to understand their colleagues—they have only taken the first step. I may mention here that although the English are usually despised as linguists, I found that they were second only to the Dutch. Many of us arrived with only school French plus that acquired on holidays or with the British Expeditionary Forces in 1939-40—but it was accepted that almost all English officers, after a few months, could usefully attend conferences, or work in offices, where the work was conducted in French. I have, however, heard on a recent visit to France that this is now by no means always the case. This seems to be a pity.

Background Knowledge

One must go much further than having a grasp of the language. Some knowledge of the history of our allies is essential—and surely only rather dull officers will find this a tedious idea. To understand why, for example, the French are sensitive to even an implied criticism of their military ability, you must know what the *Grande Armée* achieved, and why Austerlitz seems more significant to them than Busaco or Salamanca. You must know that the Dutch were at the Schellenbeurg and Malplaquet, which were not won entirely by the Redcoats. If such things are new to you, they may give you a healthy shock. They need not involve long hours of study.

Again, some grasp of the political and economic background of our allies is essential. Before joining my international headquarters, I worked as a humble acolyte in the high priesthood of the General Staff in the War Office. My fellows and I thought we had a broad outlook on great affairs. But when I paid a flying visit to my former office some 18 months later, I realized that its outlook was in some ways parochial—as ours had been. For example, I was told with authority that one French private soldier in four was a Communist—Moscow type. A knowledge of the truth shows the danger of such statistically-based information.

Domestic Life

This brings me to the question of domestic life. Military society is inevitably restricted and artificial. It is necessary to escape the banalities of the familiar cocktail party if one is to understand one's allies a little. This is not easy, as in most continental countries the family is a close-knit circle, the entry to which is jealously guarded. The average civilian Frenchman or Belgian needs an unimpeachable introduction, or clear evidence of acceptability—the chance to provide which is not easy to find—before opening the door. Therefore, any opportunity which the normal domestic life gives should be taken.

It is better for this purpose to live in a community where one's compatriots are rare—a village—than in a town, where they, and the general military circle, are more numerous. Daily life in the village will lead to contact with the *Curé*, the *Maire*, the butcher, the wine merchant, not to mention one's *femme de ménage*, from all of whom more may be learned of one's hosts than from the friendly, but often rather formal, contacts formed through the office. The habit of reading a national newspaper is also valuable—not only the editorials by Francois Mauriac, but also the stories of widows *assomées à coups de hache*—or vice versa.

A last word on comprehension—it is worth remembering that most peoples expect a certain conformation to types on the part of foreigners. Most Frenchmen with friendly feelings toward the English expect the good English officer to be straightforward in thought and word, competent and fairly zealous, of reasonable intelligence, but not intellectual. If they find a subtle British officer—unless he has special qualifications of parentage or upbringing—they will tend to be suspicious. Thus, some officers who are, shall we say, Francophile by nature, are disappointed that their efforts to understand and to think with their allies are less warmly received than those of their more conventional fellows. It is the latter who more often are termed *bons camarades*—but let not the former weary in well-doing!

Conclusion

Personally, I hope that most of our future leaders will serve on one of these vast headquarters. It is a unique experience and one which is necessary for most men if they are to understand clearly and realistically the problems of allied cooperation. Those who are appointed must expect to meet frustration and difficulties, unless they are men of exceptional calmness. Looked at philosophically, this will at least give them opportunity to improve their power of self-discipline and restraint! To balance—and usually to weigh heavier in the other scale—there is first the fascination of watching different minds and temperaments in action, and second, the great chance of living in a strange land, as a temporary citizen rather than as a tourist. Whatever one's views on Federation, it can only be to the general good to learn to be a "good European."

Finally, it is a worth-while job to help to make Anglo-United States and Anglo-European alliance work as, in the last analysis, work they must.

Since our nation has assumed the role of world leadership in the fight for freedom, there are certain international facts of life we must face.

Major General E. F. Bullene

All Men Are Brothers, Even in War

Digested by the MILITARY REVIEW from an article by Captain J. G. Sloman in the "Australian Army Journal," July 1953.

SINCE the earliest time, war has been a familiar phenomenon in the history of the world. In fact, of the 3,400 years of recorded history a war of some kind has been in progress for a total of 3,150 years, and since 1914, there has not been a single day on which an armed conflict of some type has not been in progress in some part of the world. Yet, during these thousands of years the idea of alleviating the horrors of war had made scarcely any progress. The champions of the idea have been so few that some of them are cited as memorable exceptions.

The Laws of Mano forbade the Hindu warrior to kill his disarmed, sleeping, or wounded opponent, and prohibited the use of poisoned missiles and barbed arrows.

In 550 B. C., Cyrus, King of the Persians, ordered the physicians of his army to nurse all the wounded on the field, friend and foe alike.

During medieval times, knights and nobles solemnly promised not to attack churches, unarmed monks, or peaceful traders, nor to fight on certain days of the week.

This chivalry did not last, and by the end of the nineteenth century, modern war, as we know it today, was evolved on Europe's battlefields.

In 1859, at Solferino, was fought one of the most bloody battles of the coming era. The French and Austrians left on the field approximately 40,000 wounded to die without hope of assistance. By chance, a young Genevese banker, Jean Henry Dunant, arrived on the scene soon after the battle.

He was so profoundly moved by the sufferings of the abandoned wounded that he organized the local population and some fellow travelers to give what aid they could to the stricken men. Working day and night, they saved many who otherwise would certainly have died.

Birth of a Service

Dunant was so affected by this experience that he resolved to do all in his power to arouse the conscience of mankind. In 1862, he published a book, *A Memory of Solferino*, in which he described in powerful and moving language the aftermath of Solferino. In Geneva, he formed a committee of five members under the chairmanship of one of the most venerated men in Swiss history, General Guillaume Dufour, the victorious leader of the Swiss federal troops in the civil war of 1847. The other members comprised two doctors, a lawyer, and Dunant, himself. This original "Committee of Five" was the forerunner of the present International Committee of the Red Cross.

At its inception, the principal task of the Red Cross was to alleviate the sufferings of sick and wounded soldiers who could no longer take an active part in the fighting. In the course of time the field of action has been greatly extended to include activities not connected with war, such as the general improvement of health, the fight against disease, and relief after catastrophies of all kind. Nevertheless, the principal task of the Red Cross remains the provision of assistance in time of war to those who have ceased to be combatants because they are sick, wounded, or have been taken prisoner.

Each National Red Cross acts in part as "an auxiliary to the Army medical service of its country." In addition, it has special tasks to be carried out in time of war, as outlined in the "International Humanitarian Conventions of the Red

Cross," generally known as the "Geneva Conventions." With this general understanding of the basic purposes of the Red Cross organizations, we can now consider their two main functions more fully.

Medical Services

In 1859, when Henry Dunant conceived the idea of helping the sick and wounded, the medical services of the European armies were unorganized and inefficient. Public opinion was aroused by the appealing language of *A Memory of Solferino* and the activities of the National Red Cross Societies established in several countries. The Army medical services were reorganized and, for a start, staffed largely by Red Cross personnel. Gradually, however, European military authorities accepted the idea that the provision of an efficient medical service was their direct responsibility. In April 1952, an International Red Cross survey noted that in only six countries did their societies undertake the management of service hospitals and the provision of trained medical personnel. In the other countries, help was given mainly as a supplement to the medical service provided by the military authorities. In these countries, social assistance and moral comfort to help war victims overcome their disabilities had become a main task for the Red Cross.

However, not all Army medical services have reached a satisfactory standard of efficiency. In some cases, Red Cross assistance in the form of trained staff and technical advice is still required. Guidance is given to all countries, with particular emphasis on standardization. Some current problems are:

1. The apparatus and equipment to be used for blood (and blood substitute) transfusions.

2. Various types of medical accessories to be carried in the field for the use of the sick and wounded, including the soldier's individual field dressing.

3. Medical transport equipment, including various forms of field stretchers and their adaptation to motor vehicles, helicopters, and planes.

4. Recent advances in mobile medical equipment for setting up operating theaters and field dressing stations close to the scene of battle.

5. Important discussions are regularly taking place on standardization of health and medical means of defense against new weapons—biological, chemical, and mechanical.

Thus, it can be seen that although the original function has been somewhat modified, there is still a requirement for an active National Red Cross to act as an auxiliary to the Army medical services, both by standardization and preparation in peace, and by active assistance in war.

The Geneva Conventions

In war, certain rules of conduct should be observed toward enemy nationals as well as toward one's own countrymen. The principles of these rules are expressed in the four Geneva Conventions of 12 August 1949, which nearly all countries have now pledged themselves to observe.

These Conventions govern the individual soldier's behavior both toward enemy soldiers in the field and civilians who become involved in military operations. Without going into details of the Conventions, it may be said that certain principles of conduct expressed therein are binding on the nationals of all countries which have signed them. Persons not actually taking an active part in hostilities must in all cases be treated humanely. This is a cornerstone of the Conventions. Thus, sick and wounded soldiers, prisoners of war, and civilians are all entitled to be treated humanely in accordance with the Conventions.

The four Conventions contain a series of Prohibitions specifically stated. The fol-

lowing acts are prohibited at all times and places in respect of persons protected by the Conventions:

1. Violence to life and person, in particular, murder of all kinds, mutilation, cruel treatment, and torture.

2. The taking of hostages.

3. Outrages upon personal dignity, in particular, humiliating and degrading treatment.

4. The passing of sentence and the execution of sentence without previous judgment pronounced by a regularly constituted court affording all the judicial guarantees which are recognized as indispensable by civilized people.

Certain grave breaches of the Conventions are mentioned specifically and the individual committing them is liable to suitable punishment. These include wilful murder, torture, and inhumane treatment, including biological experiments. Under the Conventions, the individuals committing a prohibited act are held to be equally responsible with the State. The excuse that he was only obeying orders does not absolve the individual from responsibility for his actions.

The Conventions now apply equally to civil and international wars. The obligation for the military authorities to treat protected persons humanely, the absolute prohibition of the acts mentioned above, the obligation to collect and care for the sick and wounded, whether friend or foe, henceforth apply to any form of conflict, whether it is a civil war or a war between two or more states, and whether or not war has been declared officially. The Conventions also apply to cases of occupation of foreign territory.

In war, the interests of the citizens of the belligerent states may be safeguarded by neutral states, known in the Conventions as Protecting Powers. The provisions of the Conventions will be applied with their co-operation and under their supervision. Their delegates will be empowered to visit prisoners of war and civilian internees, and to observe whether the belligerent states are carrying out their obligations under the Conventions.

While it is at present impossible to eliminate all the horrors of war, the application of the provisions of the Geneva Conventions will go a long way to save millions of human beings and to mitigate their sufferings.

Nor are its [world communism] methods less unscrupulous or barbaric. On the contrary, it has resorted to means whose abandonment by less sinister tyrannies was long since forced by the advance of civilization. Among these means are torture, not only physical but mental; murder of prisoners; obliteration of truth; subversion; and blackmail. It follows the tactics of conquest by division, of sowing fear and suspicion to set peoples against each other.

Thus, at times it has achieved its wicked ends without the use of physical compulsion.

General Charles L. Bolte

BOOKS OF INTEREST TO THE MILITARY READER

THE RETURN OF GERMANY. By Norbert Muhlen. 310 Pages. Henry Regnery Co., Chicago, Ill. $4.50.

BY LT COL JOHN E. OLSON, *Inf*

"The giant stirs again. Seven years ago, after a fight to the finish with his neighbors and enemies, he was prostrate. Some believed him dead, or at least permanently crippled. When he turned out to be neither dead nor a hopeless invalid, many became uneasy, even fearful."

With this introduction, Mr. Muhlen sets out to analyze the giant—Germany—as it is today. He feels that while West Germany will never emerge with American democracy, it will, if properly guided and assisted, develop its own brand of democracy that will preclude its falling into the clutches of the Communists or Neo-Nazis, and make it a welcome member of the democratic family of nations.

This accomplishment requires that the democratic peoples be fully informed of conditions within Germany, and that the democratic nations be alert, clear thinking, and diplomatic in their dealings with the new West German republic.

It is interesting to note the similarity between what the author recommends should be the relationship between the democracies and East Germany, and the reactions of the democracies to the East German riots of 1953.

The importance of Germany in the international future cannot be overemphasized. Whether the reader subscribes to the ideas presented by Mr. Muhlen or not, he will certainly find this book thought provoking.

BRITISH PRIME MINISTERS. Introduced by Duff Cooper. 177 Pages. Roy Publishers, New York. $3.50.

BY COL GEORGE V. BRITTEN, *British Army*

This book contains chapters on Prime Ministers Walpole, Chatham, North, the younger Pitt, Spencer Perceval, Canning, Wellington, Palmerston, Peel, Grey, Disraeli, Gladstone, Salisbury, Balfour, Baldwin, and Chamberlain—all men who reached what Disraeli irreverently termed "the top of the slippery pole."

Well written and interesting, the book does, however, call for considerable background knowledge of British history on the part of the reader.

Great powers have never been at the disposal of British Prime Ministers. Their retention of office depends upon the good will of the House of Commons.

The 16 Prime Ministers whose characters are outlined in *British Prime Ministers*, with the exception of North, leave the British people with little cause for complaint. If genius is rare among them, talent is common: and "the high level of mediocrity has been illuminated now and then by the personality of a Chatham, the eloquence of a Pitt, the wit of a Canning, the glitter of a Disraeli, the grand manner of a Gladstone and the transcendent effulgence of a Churchill."

How much more fortunate to be governed by benevolent mediocrities—honest men doing their best for their fellows—than those so-called supermen, the Bonapartes, the Hitlers, the Stalins, who have "left the world more miserable than they found it!"

THE MAN WHO NEVER WAS. By Ewen Montagu. 160 Pages. J. B. Lippincott Co., Philadelphia, Pa. $2.75.

BY LT COL DONALD L. DURFEE, *Inf*

Another of the "now it can be told" stories, this book is for those who are interested in intrigue and military intelligence. It is a story of a triumph of British Naval Intelligence over the spy network of Admiral Canaris and Hitler. It can scarcely be recommended as a study, and offers little in the way of lessons learned. It is an interesting account of how an enemy might be, and in this case was, deceived.

The book is well written and easy to read. It has a fascinating, if somewhat macabre, plot which tells how a corpse, supplied with spurious letters and false papers, was set adrift in the Mediterranean to wash ashore on the coast of Spain in the spring of 1943. The operation was successful and the Germans were thoroughly misled thereby. The allied invasion of Sicily was eased as a result.

The many difficulties encountered in preparing the various phases of the operation with the attendant security in which it was cloaked, the near mistakes which might have doomed it, and the risks involved, add up to an interesting story.

A STILLNESS AT APPOMATTOX. By Bruce Catton. 438 Pages. Doubleday & Co., Inc., New York. $5.00.

BY MAJ JOHN J. EARLEY, *Inf*

Bruce Catton, author of *Mr. Lincoln's Army* and *Glory Road*, in his usual and inimitable style, tells the story of the last desperate, heartbreaking, cruel year of the Civil War. Because of his accurate, detailed, and well-documented descriptions, Mr. Catton's book will be of particular interest to the military reader.

UNDERSEA PATROL. By Commander Edward Young. 298 Pages. McGraw-Hill Book Co., Inc., New York. $3.95.

THE FALL OF THE PHILIPPINES. United States Army in World War II. By Louis Morton. 626 Pages. Superindendent of Documents, U. S. Government Printing Office, Washington, D. C. $5.25.

THE NEW INTERNATIONAL 1953 YEAR BOOK. A Compendium of the World's Progress for the Year 1952. Edited by Henry E. Vizetelly. 624 Pages. Funk and Wagnalls, New York. $10.00.

THE ATOMIC SUBMARINE AND ADMIRAL RICKOVER. By Clay Blair, Jr. 369 Pages. Henry Holt & Co., New York. $3.50.

BY CDR RALPH J. BAUM, *USN*

This book should carry the title "Admiral Rickover and the Atomic Submarine" as it is an eulogy to the man, utilizing his efforts to develop the nuclear power plants for submarines as a background. It is a well-written, smooth-reading narrative that brings forth the trials and tribulations of the small group of men, who, along with Admiral Rickover, had such a major part in the developing of the first power plant that harnesses atomic power.

However, as most eulogies do, this one makes the most of those qualities that make Rickover such a controversial figure today.

One particular incident, related as an example of his thrift and efforts to save the taxpayers' money, endangered a multimillion dollar cruiser, as well as his own command, a minesweeper, in an effort to save a few hundred gallons of gasoline during a bombing attack on Shanghai by the Japanese. This incident turned out in the then Lieutenant Rickover's favor, as neither of the ships were hit, but it could have been disastrous.

THE LOVE AND FEAR OF FLYING. By Professor Douglas D. Bond. 190 Pages. International Universities Press, Inc., New York. $3.25.

DECISIVE BATTLES OF THE U. S. A. By Major General J. F. C. Fuller. 416 Pages. The Beechhurst Press, Inc., New York. $6.00.

BY MAJ HERBERT D. CLARK, *AGC*

Believing that our past wars have been a major factor in making this country what it is, General Fuller presents, in this comprehensive study, a complete roster of those crucial actions on which our national life has turned.

A professional soldier, military writer, and historian of international repute, General Fuller has written a lucid, nontechnical, and absorbing account of every decisive American battle from Revolutionary times down to the outbreak of World War II. From Trenton, Vicksburg, and San Juan Hill to Meuse-Argonne, all the historic conflicts that have become epics in American courage and strength are given full treatment.

At a time when military affairs once more occupy the forefront of our national attention, the importance and timeliness of this volume can hardly be overestimated in its value to the layman and military man.

HIDDEN THREADS OF HISTORY. Wilson Through Roosevelt. By Louis B. Wehle. 300 Pages. The Macmillan Co., New York. $4.00.

BY MAJ DANIEL J. KERN, *USAR*

Hidden Threads of History, as Allan Nevins writes in the introduction, is "the record of a singularly useful life, given in large part to the national service without thought for rewards, political or pecuniary, or even for public recognition."

Mr. Wehle's story begins with World War I and carries through to his service with the SHAEF mission to the Netherlands.

A distinguished attorney, devoting himself to governmental tasks, Mr. Wehle emerges from this story as a citizen with a rare knowledge of men and events.

GERMANY, KEY TO PEACE. By James P. Warburg. 344 Pages. Harvard University Press, Cambridge, Mass. $4.75.

BY LT COL GEORGE E. LARSEN, *QMC*

West Germany has already become, according to the author, the dominant power on the European Continent, chiefly through our aid. It is the key to peace only if it is reunited, demilitarized, and neutralized.

Mr. Warburg pictures the present status as being the result of a policy of attempting to "contain a windstorm with bayonets." He gives a step-by-step documented record of the development of this policy which the United States followed as it abandoned its original objectives of creating a new, peaceful German nation, and substitutes in its stead the rearmed two-thirds of the old area to be the keystone of Western security.

This is a thought-provoking book, written by a man with a wealth of experience in European affairs.

HOW RUSSIA IS RULED. By Merle Fainsod. 575 Pages. Harvard University Press, Cambridge, Mass. $7.50.

BY LT COL MISHA N. KADICK, *Arty*

Mr. Fainsod has, for some time, been an advocate and user of a relatively new source of information on the Soviet Union—the defector. He has utilized the testimony of Soviet defectors as a supplement and a check on the accuracy of other source material.

He devotes considerable attention to the Secret Police and his chapter "Terror as a System of Power" is one of the best existing expositions on the subject.

Particularly interesting to the career officer is the chapter on "The Party and Armed Forces." No one book can be all inclusive on such a vast and controversial subject. This one certainly has a number of gaps. It will, nonetheless, be the authoritative work on the subject for some time to come.

THE FUNDAMENTALS OF WORLD PEACE. By A. Hamer Hall. 112 Pages. Philosophical Library, New York. $3.00.

COMMAND MISSIONS. A Personal Story. By Lieutenant General L. K. Truscott. 556 Pages. E. P. Dutton & Co., New York. $7.50.

ENGINEERS OF THE SOUTHWEST PACIFIC, 1941-1945 Volume VI, Airfield and Base Development.* Edited by Lieutenant Colonel George A. Meidling. 559 Pages. Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. $6.25.

BY COL GEORGE C. REINHARDT, *CE*

As a "record of the activities of the construction forces of the Corps of Engineers in the Southwest Pacific," the editor presents a thoroughly documented and effectively illustrated account. Excellent map coverage enhances the value of the volume.

The first six chapters cover the construction effort in a geographical area, beginning with Australia and concluding with the Occupation Forces. A final chapter contains the resumé of "construction policies, designs, and methods."

Three of the four appendices reprint official directives, but Appendix I, "Engineer Construction in the Defense of the Philippines," is regrettably short. Editor Meidling credits much of its information to an unnamed Filipino patriot who "buried at fearful risk" the personal files of the staff engineer. Readers will regret that the record of those terrible days could not have been expanded, for the lessons of defeat are invariably more educational than those of victory.

* The original manuscript of this book was used by Lieutenant Colonel M. J. Reichel in preparing his article, *The Heart of a Shore Party* (MILITARY REVIEW, October 1952), and portions of this article are taken directly from this manuscript. The MILITARY REVIEW wishes to thank Lieutenant Colonel George A. Meidling who supplied the original manuscript to Colonel Reichel, the authors, and the Office of the Chief of Military History for their cooperation in making this article possible.—The Editor.

LOGISTICAL SUPPORT OF THE ARMIES. The European Theater of Operations, Volume I. By Roland G. Ruppenthal. 616 Pages. Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. $4.50.

BY MAJ RUPERT AMY, *Inf*

Logistical Support of the Armies, latest volume published in the European Theater subseries of the burgeoning history, UNITED STATES ARMY IN WORLD WAR II, tells the vital story of how the mighty United States armies, under General Dwight D. Eisenhower, were built up in the United Kingdom for the great Normandy invasion of 1944, and how they were supplied during the first 3 months of operations on the European Continent.

A narrative account of supply operations is a rarity in the annals of military history. Most writing on the subject consists of the "how to do it" type, as found in Army manuals and regulations. Dr. Ruppenthal, author of the combat history *Utah Beach to Cherbourg*, and veteran of four World War II campaigns with VII Corps and Third Army, has written a lively "how it was done" account.

WORLD POPULATION AND PRODUCTION. Trends and Outlook. By W. S. Woytinsky and E. S. Woytinsky. 1,268 Pages. The Twentieth Century Fund, New York. $12.00.

SHERIDAN THE INEVITABLE. By Richard O'Connor. 400 Pages. The Bobbs-Merrill Co., Inc., Indianapolis. $4.50.

BY LT COL THOMAS O. BLAKENEY, *Armor*

Some authors of biographies become completely enamored with the historical person about whom they write. Such enchantment inevitably colors the score. If the experienced military reader can plunge through the first chapter of *Sheridan the Inevitable* without putting the book down forever, then he will find the subsequent chapters quite accurate, well written, and a contribution to military history.

A HUNDRED YEARS OF WAR. By Cyril Falls. 419 Pages. The Macmillan Co., New York. $6.00.

BY MAJ CARL V. CASH, *AGC*

This is a book devoted to the wars which have taken place during the past 100 years, beginning in 1850, the start of the period which saw the development of new missile weapons. While the causes of wars are outlined, the author devotes his attention to the wars themselves, their characteristics, strategy, tactics, weapons, and administration. The book is well documented and 20 maps of representative battles or campaigns are included. This is a valuable book for the military scholar or the student of warfare.

RAND McNALLY WORLD GUIDE. Selected and Adapted from the *Columbia Lippincott Gazetteer of the World*. 726 Pages. Rand McNally & Co., New York. $6.95.

THE AUSTRALIAN WAY OF LIFE. Edited by George Caiger. 158 Pages. Columbia University Press, New York. $3.00.

BY LT COL GEOFFREY D. SOLOMON
Royal Australian Army

By arrangement with UNESCO, the Australian Institute of International Affairs presents seven studies of various aspects of Australian life. In each instance the writer is an authority in his own field. Necessarily, in this method there is a lack of unity, but this is compensated for by the penetrating observations of the expert. It is essentially a critical and objective book written to please no particular body of opinion, and in this lies its strength and value.

For the Australian reader of this type of work (regrettably not a large part of the population as several passages in the book make clear), it provides salutary reading; for a wider public, it presents a brief, clear picture of life in a country about which there are still many misconceptions.

THE STORY OF THE U. S. CAVALRY. By Major General John K. Herr and Edward S. Wallace. 275 Pages. Little, Brown & Co., Boston, Mass. $6.00.

BY LT COL GREY DRESSER, *Armor*

Here, graphically presented in text and pictures, is the colorful history of the Cavalry—from its modest beginnings, to its mechanized operations in Korea.

This is a history of a proud branch of service, and individual stories of the men who made it proud.

POLAND. WHITE EAGLE ON A RED FIELD. By Samuel L. Sharp. 338 Pages. Harvard University Press, Cambridge, Mass. $5.00.

A SERGEANT NAMED BATISTA. By Edmund A. Chester. 276 Pages. Henry Holt and Co., New York. $3.50.

THE MIDGET RAIDERS. By C. E. T. Warren and James Benson. 318 Pages. William Sloan Associates, New York. $4.50.

BY CAPT DAVID J. WELSH, *USN*

This is the story of a small group of heroic men whose exploits in human torpedoes and midget submarines were hidden behind a veil of security during World War II.

The 2-man torpedoes—or chariots as the British called them—were the first to reach operational status. After a heartbreaking failure to reach the *Tirpitz* at Trondheim, they were transferred to the Mediterranean where they attacked the Italian fleet at Palermo and La Spezia, sinking two cruisers and several smaller ships. They were subsequently used for beach reconnaissance prior to the Sicily invasion.

If the book has a fault, it is the rather monotonous naming of all personnel in the author's evident desire to give credit where credit is due.

HAMMOND'S LIBRARY WORLD ATLAS. 312 Pages. C. S. Hammond & Co., New York. $5.95.